

BLOCK 8

The Fender House facility, located at 3550 Third Street, is an automobile parts and scrap metal storage yard. The salvage yard, extending the length of Block 8, is accessible from Custer Avenue. Oil stains were noted at the entrance to the yard. Debris and dried grasses were observed along the fence on Custer Avenue.

BLOCK 9

The Peeters Transportation Company, Inc. maintains a dispatch office, located on the corner of Phelps Street and Davidson Avenue, and a van storage and maintenance yard. The company operates as a moving and transportation business. Two above ground fuel dispensers are located at the entrance of the maintenance yard on Davidson Avenue. (See Section 4.4 Above Ground Storage Tanks).

An iron metal works warehouse (company name not determined) is located at 1464 Davidson Avenue. The specific operations conducted on-site could not be discerned during the site reconnaissance.

The Specialty Glass and Mirror warehouse and distribution facility, adjacent to the iron metal works warehouse, is located on the corner of Davidson Avenue and Quint Street. Active hydraulic machinery and large wooden receiving crates were observed on-site.

On the southeast corner of Custer Avenue and Quint Street, at 1495 Custer Avenue, a food warehouse occupies the site of the former McKesson Chemical Company. A chain-linked fence encloses an open area south of the warehouse entrance. The area appears to be used as a loading/unloading common area accessible to those warehouses bordering Custer Avenue and Davidson Avenue (i.e. Specialty Glass and Mirror). Two 55-gallon containers were noted on the southwestern portion of the common area. The contents of the unlabeled drums could not be determined (See Section 4.4 Above Ground Storage Tanks).

BLOCK 10

Located on the southeast portion of Block 10, bordered by Phelps Street and Davidson Avenue, is the Newport Fish/San Francisco Fish Company storage warehouse. The fish storage warehouse can be accessed from an Evans Street entrance, however, warehouse operations were observed from the Davidson Avenue truck loading/unloading area. A used office furniture warehouse adjoins the Newport Fish warehouse westward along Evans Avenue. The warehouse appears to be used primarily for storage purposes.

NAPA Bay Engine and Parts Co. operates a driveline specialties automobile repair shop at 1630 Evans Avenue and a retail automobile parts sales shop at 1640 Evans Avenue. Two waste oil containers, approximately 35 to 45 gallons each, were observed at the entrance of the NAPA auto repair shop.

Numerous flammable and nonflammable gas cylinders of various sizes were noted at the Bayox Welding Equipment and Gas, Inc. facility located at 1690 Evans Avenue. The facility maintains an expansive product loading/unloading and storage area. Company vehicles displaying identification numbers CA10843 USDOT247313 are located in the loading area. Gases stored in the containers include liquid carbon dioxide, nitrogen and oxygen. (See Section 4.2 Underground Storage Tanks and Section 4.4 Above Ground Storage Tanks).

A slight varnish odor was detected in the vicinity of the San Francisco Door Company at 1698 Evans Avenue. Company trucks are stored adjacent to a vacant area to the rear of the facility (directly north). Heavy staining of the ground surface was noted in the vacant lot, and a small accumulation (puddle) of oil was observed on the perimeter of the lot along Quint Street (See Section 4.2 Underground Storage Tanks).

Continuing east of the vacant lot along Davidson Avenue, a subdivided warehouse is occupied by various light industrial businesses including: Chi Fung Plastics, Inc., and TEC FLOR Surfaces, Inc. also identified as Protec Chemical.

Bay Engine and Parts Company, a company providing air cooled engine parts and services, occupies the property at 1439 Davidson Avenue. Two 55-gallon containers and one 5-gallon waste oil container were noted on the perimeter of the property.

Located east of the Bay Engine and Parts Company at 1425 Davidson Avenue, Scene 2 Sets and Props warehouses woodworks, paints and various theatrical facades and props. Orange paint residue was observed at the mouth of a grated sewer drain located on the Scene 2 property.

BLOCK 11

Lion Imports is located on the northwest corner of Quint Street and Custer Avenue. Operations at the large warehouse appeared closed at the time of the site walk-through, therefore, on-site operations could not be ascertained.

BLOCK 12

Sanford Exhibits, Inc. is located on the corner of Davidson Avenue and Rankin Street at 191 Rankin Street. The warehouse building appeared unused at the time of the site reconnaissance. A sign on the building indicated the maintenance or the previous maintenance of a machine shop on-site.

Freeway Store Fixtures maintains a storage warehouse and distribution facility east of the Sanford Exhibits, Inc. facility at 1560 Davidson Avenue. Small gravel stockpiles were observed on the property (usage could not be determined by visual observation).

Echo-West, Inc., a general contractor operation, is located at 1500 Davidson Avenue. Specific on-site operations could not be discerned from observations of the building exterior. (See Section 4.5 Hazardous Materials and Hazardous Waste Sites).

The Keystone Brothers warehouse is located at 1501 Custer Avenue, on the southwest corner of Custer Avenue and Quint Street.

BLOCK 13

All Auto Dismantlers, Inc., an automobile salvage and wrecking yard, occupies the length of Block 13 along Evans Street extending north towards Davidson Avenue. The yard is bordered by a solid corrugated metal fence approximately 12 feet in height. The fence displays an advertisement for the M & M Auto Wreckers facility located at 1790 Evans Avenue. Railroad tracking transects the salvage yard in an east to west direction separating the property into two portions. The administrative office is located at 398 Quint Street. Slight oil staining was observed near a storm sewer located in the vicinity of the administrative office.

BLOCK 14

ABC Auto Parts is located adjacent to the Sanford Exhibits, Inc. building at 2 Rankin Street. The large moderately delapidated concrete building extends westward to the Embarcadero Freeway overpass and northward toward Islais Creek. American Diesel, a truck and bus repair operation, is also located on the ABC Auto Parts property.

BLOCK 15

Block 15 is occupied by the AC Auto Wreckers and Radiator Shop. The property, currently used as a large automobile salvaging and storage site, has been selected for the expansion of the Southeast WPCP facility (See Figure 2). A small administrative office is located at 220 Rankin Street. A Department of Public Works Industrial Waste Sampling unit was observed on the perimeter of the salvage yard property, south of the administrative office entrance, along Rankin Street. Current operation of the unit could not be determined during the preliminary visual observations. Access to the salvage yard is attained on Davidson Avenue. Numerous automobile engine parts and heavy oil staining were noted at the yard entrance.

BLOCK 16

Circosta Iron and Metal Company, located at 1801 Evans Avenue, occupies an expansive portion of Block 16. The facility, located west of the Southeast WPCP primary treatment facility, is bordered by Rankin Street, Evans Avenue and the Southern Pacific railroad right-of-way (SP). Heavy automobile salvaging and wrecking activities were observed at the Circosta operation. Large quantities of scrap metal resulting from salvaging activities are stored on-site. (See Section 4.3 Underground Storage Tank Fuel Leaks).

BLOCK 17

The existing sewage treatment facility spans from Evans Avenue across Jerrold Avenue to Newcomb Avenue. A brief overview and description of plant operations was provided by Mr. Steve Mullinex of the DPW on September 6, 1989. According to Mr. Mullinex, the portion of the treatment facility located on the block bounded by Evans and Phelps Streets consists of a pretreatment area, a primary treatment area, secondary aeration, oxygen generation, secondary clarifiers, and central maintenance shops. The administrative offices are located at 750 Phelps Street. The portion of the sewage treatment plant bordered by Jerrold Avenue and Newcomb Avenue is comprised of solid sludge treatment areas. The solids remaining from the primary treatment areas are transported via pipelines beneath Jerrold Avenue to the solid sludge treatment areas. The perimeter of the sewage treatment facility includes various shrubbery, grasses and landscaping.

3.0 SITE HISTORY RECORD REVIEW

Information regarding historical land usage in the study area is essential in identifying potential sources of hazardous wastes from past operations conducted in the area. To attain historical data, a Site History Record Review was conducted. The records reviewed included aerial photographs and Sanborn Insurance Maps.

3.1 Aerial Photograph Review

On September 14, 1989, GRC project personnel conducted an aerial photograph review of the San Francisco Clean Water Program's Southeast Water Pollution Control Plant (Southeast WPCP) and vicinity at Pacific Aerial Surveys (PAS), Oakland, California. The review included observations of selected aerial photographs in PAS's library using a Sokkisha mirror stereoscope (Model MS27).

The purpose of performing the aerial photograph review was to determine the past land usage at the Project site and to examine potential hazardous waste sources within the study area. The 54-year time span of aerial photographs available for review ranged from 1935 to 1989. Specifically, the aerial photographs examined were taken during overflights conducted in 1935, 1948, 1955, 1958, 1961, 1969, 1972, 1975, 1977, 1979, 1981, 1983, 1985, 1988 and 1989. When vertical stereo-pairs were not available, single vertical aerial photographs were examined. Interpretive methodologies and objectives employed were in accordance with standards outlined in the Bylaws (Article II, Section 1) of the American Society for Photogrammetry and Remote Sensing (ASPRS).

The following aerial photographic features were used to identify the environmental conditions and potential hazardous waste sources within the study area:

- o Prominent storage areas.
- o Above ground storage tanks.
- o Prominent building demolition/construction.
- o Prominent scrap metal or junk yards.
- o Features suggesting the existence of gasoline service stations.
- o Features suggesting soil staining (may be due to liquid or elements which cause highly contrasting tonal variations).
- o Active grading.

In general, the prominent changes, noted during the historical review, included rapid increase of scrape metal yards, wrecking yards, and warehouses on the perimeter of the existing Southeast WPCP during the 1950's and 1960's. In the late 1970's and early

1980's a gradual encroachment of Southeast WPCP construction was noted on the Project site progressing from the east toward the west and forming the existing configuration.

During the interpretation of a each photograph, an area or feature may not have been discussed due to, but not limited to, the following:

- o Area was noted in one or more of the previous sections.
- o Only roof tops are visible and/or the resolution of the photograph is not sufficient for detailed interpretation.
- o Small vehicle parking areas are visible.
- o Open pavement exists with no apparent activity.

The aerial photograph review discusses noted features with reference to street locations and specific facilities listed in the Southeast WPCP "General Plan Layout" presented in Figure 2. The aerial photograph review covers approximately 42 acres of land, including properties or parcels within 100 feet of the perimeter of the designated Project site boundaries as presented in Figure 2. However, prominent potentially hazardous material sources located outside this area are noted as well.

The aerial photograph interpretation is listed in chronological order beginning with the earliest overflights.

Note: The aerial photograph interpretation section is presented in present tense and discusses features/facilities presently existing at the time of the overflight.

1935

These aerial photographs indicate barren and undeveloped areas in proximity of the Project site area between Evans and Davidson Avenues. The Southern Pacific Railroad (SP) is visible immediately west of this area and trends north to south. South of the intersection of Evans Avenue and the SP are four small buildings and/or sheds with parking areas, and small fenced storage areas. These structures exist in the northern portion of approximately 11 acres of unkept, debris-laden property (possibly a public dumping area, however no vehicles noted). In the center of the property is a large pond which contains abundant debris along the perimeter of the pond.

A large single story warehouse exists in the vicinity of the present-day secondary aeration area. The warehouse appears to be vacant due the lack of parked vehicles and exterior activity. An additional large warehouse with gabled roofs is seen in the vicinity of Jerrold Avenue between Quint and Phelps Streets.

A building is visible at the southern corner of the Phelps Street and Evans Avenue intersection. A significant tonal variation or stained area exists in the vicinity of the building. Approximately six buildings are situated along the south side of Evans Street between Quint and Phelps Streets. A tall metallic structure, resembling an above

ground storage tank, exists in the courtyard of one of these buildings. The location of this feature is visible in the vicinity of the present-day secondary clarifiers 2 and 3. Small aeration vats exist in the location of the present-day secondary clarifiers 5 and 9. Other large abandoned concrete vats exist near present-day secondary clarifiers 6, 7, 10, 11, 14, and 15 (See Figure 2).

A single building exists on the block east of the intersection of Quint Street and Evans Avenue. The remainder of the block is barren and undeveloped land. The block immediately northeast of this building and area, or across Quint Street, contains two large buildings with lumber and/or metal storage, indicated by elongated features.

West of the intersection of Rankin and Islais Streets is a large warehouse or building. This building is surrounded by barren and undeveloped land. The block is bounded by Rankin Street to the east, and Selby Street to the west. Two blocks appear to be undeveloped with the exception of one large warehouse and a small tractor trailer parking north of Custer Avenue, between Rankin and Third Streets. Immediately east of Third Street, between Burke Street and Evans Avenue are three warehouses in the midst of approximately 12 concrete pads or remnants of previous buildings.

1948

These aerial photographs indicate that the barren and undeveloped areas, discussed in the 1935 narrative section, located in the proximity of the Project site, contains approximately four buildings/sheds surrounded by junk yards, tractor-trailer parking and storage. The large pond noted in the previous narrative section has been filled and active grading is visible. Numerous soil and debris stockpiles as well as areas of dark stained soil are visible in the vicinity of Rankin Street between Evans Avenue and the SP. Additionally, features resembling numerous 55-gallon drums exist in the this area. East of this area, in the vicinity of the present-day oxygen generation and secondary aeration areas additional soil and debris stockpiles are noted.

Twenty one large liquid aeration ponds are visible in the location of the present-day secondary clarifiers 5, 6, 9, and 10. These ponds extend over an area of approximately two acres. Immediately northeast of these containers, along the south side of Evans Avenue, are the six buildings, discussed in the 1935 narrative, with the exception of one building. The above ground storage tank (discussed in the 1935 section) has been removed. Tractor-trailer parking, storage, and loading dock areas are present on the four blocks between Rankin and Phelps Streets, and Evans and Custer Avenues.

Approximately seven buildings with vehicle parking, storage areas and possibly two above ground storage tanks are located on Evans Avenue, between Rankin and Quint Streets. Immediately north of the intersection of Rankin Street and Davidson Avenue is predominantly barren and undeveloped property.

1955

Four above ground storage tanks are visible immediately west of the large building at the corner of Rankin and Islais Streets (location discussed in the 1935 narrative section). The tanks appear to be approximately 20 feet in diameter. Four warehouses with abundant tractor-trailer parking are visible on the block bounded by Arthur and Custer Avenues, and Islais and Quint Streets.

1958

These aerial photographs indicate that the four building/sheds, discussed in the 1935 and 1948 narrative section, located in the proximity of the Project site, have been developed into seven building/sheds with lumber and debris storage yards. East of this area and across Evans Avenue, previously a graded area, is a moderately active junk yard maintaining six storage sheds. Numerous stained areas are evident on the junk yard property. The 55-gallon storage area discussed in the 1948 photo narrative is no longer visible. Immediately south of the junk yard and in the vicinity of the present-day primary treatment plant and the secondary clarifiers is a large lumber storage area with 12 buildings. The existence of treated (based on the observation of extreme tonal variations) telephone posts in the vicinity of the secondary clarifiers 5 and 11 is indicated in the photographs. Additionally, within this vicinity, near secondary clarifiers 7 and 8, eleven aeration ponds exist. The 21 aeration ponds discussed in the 1948 narrative are no longer visible. A large stained area on the pavement near the entrance of a repair shop is visible in the vicinity of the present-day central shops.

Two Southeast WPCP primary treatment facilities and the administrative building, located on Jerrold Avenue, have been constructed. Lumber yards exist at the present-day Southeast WPCP administrative and maintenance building located on Phelps Street. Commercial warehouses and buildings now line the south side of Phelps street for the length of the project area.

A gasoline filling station has been constructed on the corner of Third Street and Evans Avenue. A warehouse exists on the triangular shape block between Davidson and Evans Avenue at Third Street.

Four new warehouses are visible east of the Davidson Avenue and Quint Street intersection. Immediately northwest and across Quint Street of the warehouses are four additional buildings. An above ground storage tank is noted in this area.

The four above ground storage tanks, noted in the 1955 narrative, are no longer visible in the vicinity of the large building at the corner of Islais and Rankin Streets. Immediately west of this area are abundant soil stockpiles. Outdoor storage is visible south of the corner of Islais and Rankin Street. The stored materials can not be determined from the photographs.

A tractor-trailer maintenance facility is located south of the intersection of Arthur Avenue and Quint Street. On the same block, bordered by Third Street, a gasoline station is visible. South of the gasoline station and the tractor-trailer facility, four warehouses are located in the central area of an auto wrecking yard. Prominent tonal variations or staining exists in the vehicle access area of the wrecking yard.

The block bounded by Third Street, Burke Street and Evans Avenue is void of buildings and structures, building pads and ground cover remain.

1961

Increasing activity is noted in the scrap metal yard east of the Rankin Street and Evans Avenue intersection and bordering the SP. Three large elongated warehouses are visible in the location of the repair shop discussed in the 1958 section (vicinity of present-day central shops).

A tractor-trailer repair/filling facility is seen in the location of the present-day Southeast WPCP administrative and maintenance building.

The large housing structure, discussed in the 1958 narrative section, is no longer visible. A new large warehouse is observed north of Custer Avenue, between Rankin and Quint Streets. The warehouse occupies approximately 60 percent of the block in the area where three smaller warehouses previously existed.

1969

A scrap metal storage and automobile wrecking yard appears to be active within a triangular area bordered by Rankin Street and the SP. A "sand and gravel" facility exists in the general location of the present-day secondary aeration facility. The large vehicle repair/filling facility, discussed in the 1961 narrative is larger and is surrounded by numerous tractor trailers.

Three sheds or small buildings replace the gasoline station (discussed in the 1958 section) located at the corner of Phelps Street and Evans Avenue. The warehouse (observed in the 1958 photographs) located on the triangular block between the Davidson and Evans Avenue at Third Street is no longer visible and has been replaced by a gasoline station. The block bordering the north side of Evans Avenue between Phelps and Quint Streets is comprised of new and refurbished warehouses. Two new warehouses have been constructed northeast of Quint Street/Davidson Avenue intersection.

The eleven aeration ponds, noted in the 1958 photographs, have been removed.

The barren parcel of land bounded by Islais Street and Davidson Avenue (discussed in 1935 narrative), now contains a large wrecking yard surrounded by a fence. Three new buildings can be seen in the vicinity of the tractor trailer maintenance facility (seen in 1958 photographs) west of Quint Street. The gasoline station located immediately east

of this area appears to be inactive, or vacant. East of Third Street, in the vicinity of Davidson Avenue, are five warehouses constructed in place of the building pads and ground cover noted in the 1958 narrative.

1972

Stockpiles (constituents of the piles could not be discerned from the aerial photographs) are visible in the southern portion of the currently existing central shops. Large stained areas can be seen in the vicinity of the present-day administrative and maintenance building. A lumber and wrecking yard now exists between Evans and Davidson Avenues and north of Quint Street, in the location of the buildings and possible above ground storage tank noted in the 1958 narrative.

1975

The stockpiled area discussed in the 1972 narrative has been replaced by a paved parking area. Additionally, the lumber yard discussed in the previous narrative has been replaced by a new scrap metal/wrecking yard.

The gasoline station located on Third Street between Arthur and Custer Avenues, has been removed and replaced by a paved parking area. Active grading is visible east of Third street between Burke and Evans Avenue.

1977

Mass grading is visible between Burke and Evans Avenue East of Third Street. This area was once occupied by five warehouses/buildings.

1979

The most prominent feature noted in these photographs is the construction of the secondary clarifiers within the present-day Southeast WPCP. All buildings and storage areas discussed in previous sections, located in the present-day secondary clarifier area, have been removed. Immediately south of this area, mobile construction buildings have replaced the large vehicle repair/filling facility noted in the 1961 narrative. A new railroad right-of-way has been constructed along Rankin Street, crossing Evans Avenue, and diagonally transecting the block between Quint and Rankin Streets.

Due to the expansion and development of the Southeast WPCP facility, the triangular area containing scrap metal and wrecking yards appears to contain less available yard space. As a result, tall stockpiles of scrap metal, deposited along the flanks of the SP embankment fill, are visible.

Prominent tonal variations are visible in the wrecking yard north of Custer Avenue, between Quint and Third Streets. The graded area east of Third Street, discussed in the previous section, is occupied by a new office building and warehouse.

1981

These photographs indicate the completion of the following Southeast WPCP areas:

- o Primary Treatment Plant
- o Secondary Clarifiers
- o Administrative and Maintenance Building

Eight new above ground storage tanks are visible southeast of the primary treatment plants.

A vacant lot containing vehicle storage and various debris exists east of the Phelps Street and Hudson Avenue intersection.

Four office buildings exist east of Third Street, between Burke Street and Evans Avenue.

1983

With the exception of the present-day pretreatment facility, the remainder of the Southeast WPCP facilities and areas are evident as depicted in Figure 2.

1985

A new building has been constructed on the corner of Fairfax Avenue and Phelps Street. The pretreatment plant has been completed.

1988

No significant changes are visible in these photographs.

1989

Three buildings exist on the lot once occupied by a gasoline station west of Third Street, in the vicinity of Arthur Avenue.

3.2 Sanborn Insurance Map Review

Sanborn Insurance Maps dating back to 1914 were reviewed for additional site history data for the Project site and study area. These maps indicate the positions of facilities, businesses, and features existing during the time of map revision. Approximately five different maps were reviewed during a total time span of 59 years and includes revisions from 1914, 1929, 1942, 1964, 1988.

The Sanborn Insurance Map review is presented in Tables 1 through 5. The tables present historical land usage information by block designation number as depicted in Figure 3. Facilities/features and businesses are listed by the block designation number. Each line of text within block designations represent the different facilities, buildings or areas located on the same block.

The nomenclature presented within the table entries are typically the same as indicated on the maps referenced.

The purpose of performing an evaluation of these maps is to determine potential contaminant sources existing within the limits of the project right-of-way study area. The following types of facilities, business and features were focused on during the review process:

- o Prominent storage areas, warehouses, and yards.
- o Above ground storage tanks.
- o Gasoline stations and vehicle repair facilities.
- o Treatment plants.
- o Scrap metal/wrecking yards.
- o Manufacturing facilities.

TABLE 1**Sanborn Insurance Map 1914**

<u>BLOCK NUMBER</u>	<u>FACILITY/BUSINESS</u>
1	Not indicated.
2	French laundry.
3	Not indicated.
4	Not indicated.
5	Blacksmith, Wheel wright.
6	Blacksmith, Wheel wright, Harness shop.
7	Wholesale butchers, cattle corrals, paint shop, wagon shed, vacant sheds.
8	Water/shoreline
9	No landfill.
10	Miller and Lux. auxiliary water supply plant, one 100,000 gal. water tank.
11	Not indicated.
12	No landfill.
13	No landfill.
14	Not indicated.
15	Not indicated.
16	California Glue Works Inc., glue plant, vats, Storage, Lime vats.
17	A.B. Patrick Company, tannery, currying, drying, and finishing. Machine shops, fuel oil tank ("in ground").

TABLE 2**Sanborn Insurance Map 1929**

<u>BLOCK NUMBER</u>	<u>FACILITY/BUSINESS</u>
1	Flats (housing). Club (saloon).
2	Flats. Hand laundry.
3	Not indicated.
4	Restaurant.
5	Gasoline station. Storage. Restaurant.
6	Auto trimming, automobile repair.
7	Moffet and Company, pork packers wholesale, wool warehouse, wool pullery, Cattle corral.
8	Not indicated.
9	H. Moffet Company, wool facility.
10	Sash and door warehouse.
11	Anderson Brothers' lumber shed, mill, dry kiln
12	Hayman Building Supply Company, planing mills, lumber shed, Sash and doors, metal shop, sheet metal works,
13	Sudden Lumber Company planing mill, lumber storage.
14	Rosenberg Brothers and Company, animal feed mill, hull, warehouses, rice mill.
15	Not indicated.
16	Glue plant, vats, glue storage, warehouse.
17	Hay and feed, Norton Wool Company, hide storage and tanning, Sash and door warehouse, Rawhide warehouse, A.B. Patrick Company, tannery, tan bark, cattle shed.

TABLE 3**Sanborn Insurance Map 1942**

<u>BLOCK NUMBER</u>	<u>FACILITY/BUSINESS</u>
1	Cattle corrals, Paper basket manufacturing.
2	French laundry.
3	Battery manufacturing.
4	Foundry, Planning mill, lumber storage.
5	Gasoline station.
6	Automobile repair.
7	Wholesale butchers, cattle corrals, wool pullery, warehouses, Levitan Hide Company, Taffe and Company, wholesale butchers.
8	Gasoline station . Motor freight storage, truck yard, Chemical warehouse, Lumber shed, woodworking, spray painting room, Contractors storage, repair shop, Auto wrecking yard, storage.
9	H. Moffat and Company, wool butchers, tanks on roof.
10	Sash and door warehouse, Storage.
11	Hayman Building Supply, lumber sheds.
12	Not indicated.
13	Christenson Lumber Company, lumber storage, planning mill, Auto repair.
14	Not indicated.
15	Automobile repair and storage.

TABLE 3 continued

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| 16 | Scrap metal yard. |
| 17 | Cattle pens,
Lumber yards,
Scavenger Protective Association, processing plant,
Storage, bottle washing,
Campbell Construction and Equipment Company,
warehouse and gasoline storage,
Lowrie Paving Company, auto parking, storage and
servicing/repair shops. |

TABLE 4**Sanborn Insurance Map 1965**

<u>BLOCK NUMBER</u>	<u>FACILITY/BUSINESS</u>
1	"Oil storage in steel drums", Warehouses, Paper basket manufacturing.
2	Candy warehouse, Electric parts storage, Scale warehouse and repair, Auto parts storage.
3	Battery manufacturing, Electrical equipment warehouse, Auto repair, Sheet metal works, Laundry.
4	Lumber storage, planning mill, Metal fabricating and welding, Gas and oil yard, Flask yard, Foundry.
5	Two gasoline stations.
6	Not indicated.
7	Trafte and Company Inc., wholesale butchers, storage and slaughter areas, sheepsheds, Two vacant warehouses, Tractor sales and service, Motor freight storage Van and storage warehouses, Hide warehouse, wool pullery.
8	Auto parts storage, repair shop, auto wrecking yard, Gasoline station truck repair, Motor freight storage, pipe storage, truck repair, Cabinet shop, wood working shops, spray painting area.
9	Not indicated.
10	Sash and door warehouse, Welding supplies (oxygen and acetylene storage), Plastic product fabrication, Truck and materials handling, sales and service, Harow warehouse, Marine equipment and fire extinguisher refill.

TABLE 4 continued

11	Auto storage. Auto body warehouse, metal spray booth. Van and storage. Pan cleaning and glazing. Spray painting in metal booth, paint storage and cabinet shop. Storage fixture warehouse.
12	Motor scooter and parts warehouse, Shower door manufacturing. Graphic arts supply warehouse.
13	Lumber sheds, planning mills.
14	Fish packing warehouse, cooler, fish reduction plant.
15	Barrett Construction Company, automobile repair, automobile storage, warehouse.
16	Scrap metal yard, parts storage area.
17	G.B. Torre and Sons, Scavengers Protective Association, Laundry, Baled paper storage, San Francisco Southeastern Sewage Treatment Plant, Di Salvo Trucking Company, truck repair and storage.

TABLE 5**Sanborn Fire Insurance Map 1988**

<u>BLOCK NUMBER</u>	<u>FACILITY/BUSINESS</u>
1	Warehouses, Gas and oil yard, Pipe fitting storage.
2	Auto parts, auto wrecking.
3	Sheet metal works, auto repair, "Bleaching Water Bottling".
4	Lumber storage, planning mill.
5	"Gas and Oil", gasoline station.
6	Gasoline station.
7	India Basin Industrial Park offices, other buildings, not indicated
8	Auto wrecking yard, storage, repair shop, other buildings not indicated.
9	Flammable chemical storage, Van and storage warehouse.
10	Fish bait warehouse, general storage, Industrial engine rebuilding, Marine equipment and fire extinguisher refill, Trucks and materials handling, equipment sales and service, Plastic fabrication, Carpet warehouse, Sash and door warehouse, Welding supplies (oxygen and acetylene).
11	Sterilizing equipment warehouse, metal spray booths, Metal fabricating, Plate cleaning and glazing, Spray painting in metal booth, Cabinet shop, Store fixture warehouse.
12	Motor scooter and parts warehouse, Sash and door manufacturing, Graphics art supplies warehouse, Van and storage warehouse, Asbestos production and warehouse, Asphalt tile warehouse.

TABLE 5 continued

- | | |
|----|--|
| 13 | Auto wrecking yard. |
| 14 | Ocean Beauty Packing Company, warehouse, cooler,
fish reduction plant, ammonia tank,
Used auto parts, "wrecked auto yard". |
| 15 | Auto wrecking yard, repair shop. |
| 16 | Scrap metal yard. |
| 17 | City and County of San Francisco, Southeast Sewage
Treatment Plant. |

4.0 HAZARDOUS MATERIALS AND HAZARDOUS WASTE RECORD REVIEW

A Hazardous Materials and Hazardous Waste Record Review was conducted to identify those facilities and/or locations within the designated Limits of Study which have historical and/or current land usage that includes the manufacturing, use, storage, and/or disposal of hazardous materials and hazardous wastes. With this information, potential environmental impacts of those operations on the Project site can be assessed.

Each facility noted during the study area reconnaissance (See Section 2.2) was investigated for information regarding the manufacturing, use, storage, and/or disposal of hazardous materials and hazardous wastes by contacting local, state and federal environmental regulatory agencies. Only those facilities identified in the agencies' hazardous materials records were addressed in the following sections. Each facility is presented by block number. The environmental regulatory agencies contacted include the City and County of San Francisco Department of Public Health Hazardous Materials Division, San Francisco Fire Department Bureau of Safety and Prevention, California Department of Health Services (DHS) Toxic Control Division, California Regional Water Quality Control Board (RWQCB), and the United States Environmental Protection Agency (EPA) Region IX.

The information provided in the Hazardous Materials and Hazardous Waste Record Review is based on the available pertinent information provided by the respective agencies. Data referenced in the Hazardous Materials and Hazardous Waste discussion, if available, are found in Appendix B (Underground Storage Tank File Data), Appendix C (Underground Storage Tank Leak File Data) and Appendix D (Above Ground Storage Tank File Data). A brief description of each agency contacted and the type of data requested and reviewed is included in the following discussion.--

4.1 Environmental Regulatory Agencies

US Environmental Protection Agency (EPA) Region IX

The EPA is the primary Federal environmental agency involved in the regulation of hazardous materials and hazardous waste manufacturing, storage and maintenance. The EPA enforces the Resource Conservation and Recovery Act of 1976 (RCRA) as amended by the Hazardous Solid Waste Act of 1984; the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The EPA National Priorities List (NPL) identifies sites in the United States that are contaminated from historical or current land usage by hazardous materials and/or hazardous wastes. The listing of these sites are determined by parameters set by the EPA.

The Comprehensive Environmental Response, Compensation and Liability Information System List (CERCLIS) is a compilation of sites which may pose a potential environmental threat due to the on-site use of hazardous materials.

California Department of Health Services (DHS)

Toxic Substances Control Division (TSCD)

The DHS is the primary State agency implementing the regulations regarding public health standards. The DHS oversees the compliance of hazardous material and hazardous waste sites with California Health and Safety Code Regulations. Additionally, the DHS maintains the database for State-funded Superfund sites (CERCLIS List).

California Regional Water Quality Control Board (RWQCB)

The RWQCB enforces those State regulations which are implemented to ensure adequate protection of water quality. Two lists regarding the impact of contaminants to groundwater are compiled by the RWQCB, the Underground Storage Tank Fuel Leak Cases and the North Bay Toxics List.

The Underground Storage Tank Fuel Leak Cases are facilities which have experienced contamination at the site from leaking fuel tanks. The North Bay Toxic Cases identifies sites which are documented groundwater contamination cases, excluding fuel tank leak cases, landfill sites, and municipal and industrial waste handling and treatment facilities.

San Francisco Department of Public Health (SFDPH)

Bureau of Environmental Health and Hazardous Materials

The SFDPH is the primary local environmental regulatory agency responsible for the enforcement of City and County of San Francisco, as well as State and Federal, environmental health codes and regulations.

The Bureau of Environmental Health and Hazardous Materials maintains records of underground storage tank modifications and releases of hazardous chemicals from storage tanks, and records of toxic chemicals used, manufactured and/or stored by San Francisco businesses.

San Francisco Fire Department (SFFD)

Bureau of Fire Prevention and Investigation

The SFFD Bureau of Fire Prevention and Investigation conducts inspections of new underground storage tank installations and issues permits for tank systems, piping and dispenser installations. The Bureau also maintains documentation of known above ground storage tanks in the San Francisco County.

Additional Resources

Additional resources contacted and reviewed for hazardous materials data include: California Waste Management Board Active Landfill Files (Solid Waste Information System, SWIS), California Office of Planning and Research - Hazardous Waste and Substances Sites List, and California Water Resources Control Board (WRCB), Report of Releases of Hazardous Substances From Underground Storage Tanks.

4.2 Underground Storage Tanks

- o **Refrigerator Storage Facility**
Block 3
1695 Galvez Street
San Francisco, California.
Source: SFFD

Keystone Batteries Inc., a battery manufacturing company, was permitted to install one 550-gallon underground storage tank on their property at 1695 Galvez Avenue. According to SFFD permit records, the tank was installed beneath the sidewalk in front of the building, with the above ground product dispenser located inside the facility. The Keystone Batteries building is currently occupied by a refrigerator storage facility. Information regarding the status of the underground tank was not documented in SFFD records.

- o **Xtra Oil Company/Shell Self Serve Station**
Block 6
3750 Third Street
San Francisco, California.
Source: SFDPH

According to a Hazardous Materials Storage Permit Application completed by the Shell gasoline service station located in June of 1989, the facility maintains four underground storage tanks. These tanks, each having a capacity of 10,000 gallons, contain regular, unleaded and super unleaded gasolines and diesel fuel. In March, 1988, Hunter Environmental Services conducted tank leak tests on each of the four tanks. Additionally, a Red Jacket pressure test to determine the integrity of the piping system was also conducted. The test results indicated that the system, including piping and tanks, "tested tight" in accordance with tank leak test standards and pressure test standards.

- o **Bayox Welding Equipment & Gases**
Block 10
1690 Evans Avenue
San Francisco, California.
Source: SFFD and SFDPH

One 1,000-gallon underground storage tank was installed on the Bayox Welding Equipment & Gases property in 1961. The diesel tank was installed on the southwest portion of the Bayox facility. Based on an SFFD Inspection History Report of the Bayox facility, the tank was removed by North Cal Construction in March of 1989. An UST Modification Inspection Worksheet completed by SFDPH inspectors indicated that the tank was in "good condition" upon removal. The worksheet noted the collection of one water sample and two soil samples for analyses. Results of the chemical analyses were not included in the SFDPH records.

- o **San Francisco Door Company**
Block 10
1698 Evans Street
San Francisco, California.
Source: SFFD

The Buckley Door Company, currently the San Francisco Door Company, was issued a permit to operate one 550-gallon underground gasoline storage tank in 1965. An SFFD Inspection History Report indicated that in August, 1989, the SFFD suggested the abandonment of the tank since the tank had not been utilized by the current tenant. No indication of the implementation of a tank abandonment program was found in the available data.

4.3 Underground Storage Tank Leaks

- o **UNOCAL Service Station #0426**
Block 6
3800 Third Street
San Francisco, California.
Source: RWQCB and SFDPH

A RWQCB Subsurface Fuel Leak Reporting Form dated December 13, 1985, noted the unauthorized release of petroleum product detected during the removal of two underground tanks at the UNOCAL station property. Noticeable perforations in both tanks were noted upon excavation. Floating product was observed during visual inspection of the tank pit (referenced in Applied GeoSystems Station Site Plan as "Old Tank Pit"). Mitigation activities included the removal of the floating product by vacuum truck and the excavation and removal of contaminated soil. Additionally, the installation of one monitoring well (MW-1) in the vicinity of the excavation was

proposed. New product tanks were installed ("New Tank Pit") south of the Old Tank Pit and a ground water monitoring system (MW-2, MW-3, MW-4, MW-5) was implemented. A January 14, 1986 letter from Applied GeoSystems to Mr. Leslie Lum of the SFDPH, discussed the status of the remedial activities conducted in the Old Tank Pit. The letter states that the "hot spots....have been successfully remediated to levels below 100 ppm total hydrocarbon". Backfilling of the tank area was conducted followed by the installation of MW-1. Removal of floating product was conducted weekly from October 1986, until product was no longer detected in February 1987. Subsequently, monthly ground water monitoring was required by the RWQCB.

In October, 1986, during a routine monitoring well inspection conducted in the "New Tank Pit" area by Applied GeoSystems, floating product was observed in MW-3. Samples were collected from the monitoring well and analyzed for the presence of TPH and organic lead to determine the constituents of the floating product (regular unleaded gasoline or super unleaded gasoline). An Applied GeoSystems Letter Report #8511-4 addressed to Mr. Paul Yamamoto of UNOCAL concluded that since the measured thickness of floating product in the well had not increased during a given timeframe, the product release was the result of overfilling or tank spillage rather than tank or pipeline leakage. The contaminated well and adjacent wells (MW-1, MW-2, MW-4 and MW-5) are presently being monitored quarterly.

The most recent letter report dated January 15, 1989, submitted by Applied GeoSystems, indicated that groundwater analyses of samples collected from MW-1, located in the "Old Tank Pit" area, contained no detectable levels of hydrocarbon contamination. Concentrations of benzene, toluene, and total xylene (BTX) detected in samples from MW-3 and MW-4, located near the "New Tank Pit" area, were above the respective action levels for drinking water as recommended by the DHS. Additionally, the concentrations of benzene and xylene in a sample collected from MW-2 and benzene in a sample collected from MW-5 did not meet recommended action levels. Recommendations from Applied GeoSystems suggested the continuation of the sampling and monitoring program throughout 1989.

A Hazardous Material Storage Permit Application filed by the UNOCAL Station in May 1989, indicated that the facility uses one 12,000-gallon underground tank to store regular unleaded gasoline and one 12,000-gallon underground tank to store premium unleaded gasoline, both tanks were installed in 1985. The Hazardous Materials Permit Application also noted the on-site store and use of motor oils, transmission oils and automobile coolants.

- o **Circosta Iron & Metal Co., Inc.**
Block 16
1801 Evans Street
San Francisco, California.
Source: SFFD

One 550-gallon leaking underground storage tank was removed from the Circosta Iron & Metal Company property in February of 1965. SFFD records indicate that the leaking tank was replaced with one 1,000-gallon underground storage tank, however, no documentation regarding tank removal, subsurface soils analyses and/or remedial activities were found in the SFFD records.

- o **Southeast Water Pollution Control Plant**
Block 17
750 Phelps Street
San Francisco, California.
Source: RWQCB and SFDPW - Industrial Waste Division

During the removal of a 6,000-gallon underground storage tank from the Southeast Water Pollution Control Plant property at 750 Phelps Street, leakage of diesel fuel from the tank was discovered. An Underground Storage Tank Unauthorized Release (Leak)/Contamination Site Report dated March 22, 1988, was filed at the RWQCB. The report indicated that soil samples collected during tank removal and analyzed for total petroleum hydrocarbons (TPH) detected 340 parts per million (ppm) of TPH. Additional comments included in the report regarding subsequent investigations stated that "The Cleanwater Enterprise will determine the extent of soil contamination and will implement appropriate action in accordance with RWQCB guidelines."

In August, 1988, ERM-West installed two groundwater monitoring wells in proximity of the excavated diesel tank area. Ground water monitoring wells MW-1 and MW-2 were installed upgradient and downgradient, respectively, of the excavation. Two soil samples were collected from each well during installation. One sample was collected at depths of approximately three and seven feet, respectively, from MW-1, and at depths of approximately two and eight feet, respectively, from MW-2. The samples were then analyzed for concentrations of benzene, toluene, xylenes and ethylbenzene (BTXE) and TPH.

Following the development of each groundwater monitoring well, a second recharge of ground water was completed prior to the collection of groundwater samples. One groundwater sample from each well was collected for laboratory analysis for BTXE concentrations. BTXE concentrations in ground water for both MW-1 and MW-2 were found below the laboratory analyses LOD.

The laboratory analyses for soil, conducted by Anlab, indicated the detection of benzene at .17 milligrams per kilogram (mg/kg) in MW-1 at a depth of 3 to 3.5-feet. This concentration of benzene is above the DHS Recommended Action Levels for drinking water standards (.007 milligrams per liter, mg/l). Toluene, xylene, ethyl benzene and TPH were either detected below the DHS Action levels or indicated below the laboratory analysis limit of detection (LOD). No BTXE and TPH concentrations were detected above the LOD in the MW-1 sample collected from 5 to 6.5 feet. BTXE and TPH levels detected in the soil sample collected from the depth of 2 to 2.5 feet were either detected below the DHS Action levels or indicated below the laboratory analysis limit of detection (LOD). However, the laboratory results of sample MW-2 from 8 to 8.5 feet showed a concentration of .12 mg/kg xylene. This concentration of xylene is slightly above the DHS Action Levels for drinking water standards (0.1 mg/l for xylene). Levels of benzene, toluene, ethyl benzene and TPH were indicated below the DHS Action Levels or below the LOD for each constituent.

4.4 Above Ground Storage Tanks

- o **Food Storage Warehouse/former McKesson Chemical Company**
Block 9
1495 Custer Avenue
San Francisco, California.
Source: SFFD

In 1952, A.J. Lynch & Company, a metal finishing product and equipment supplier, received a SFFD permit to maintain one 50-gallon above ground container ("gas buggy") for servicing two lifts (tow motors). Currently, the property is occupied by a food storage warehouse. Based on site walk-through observations, the McKesson Chemical Company apparently conducted operations from the warehouse(s) in the vicinity. However, no documentation regarding McKesson Chemical Company operations was noted in the records reviewed.

- o **Peeters Transportation Co., Inc.**
Block 9
3600 Third Street
San Francisco, California.
Source: SFFD

The Peeters Transportation Co., Inc. is permitted by the SFFD to store two 8-gallon cylinders of liquefied petroleum gas (propane) for on-site operations.

As noted in the site walk-through observations (See Section 2. 4, Block 9 discussion), two above ground fuel dispensers were observed in the Peeters Transportation maintenance yard, indicating the possible existence of underground storage tanks. However, the possible existence of underground tanks at the Peeters facility was not confirmed in the agency records.

- o **Bayox Welding Equipment and Gases**
Block 10
1690 Evans Avenue
San Francisco, California.
Source: SFFD

The Bayox Welding Equipment and Gases Company, a welding services, cryogenics and industrial supplies operation, maintains bulk storage of non flammable and flammable compressed gases on-site. The operation is identified by EPA Generator Number CAD981438971.

- o **Circosta Iron & Metal Co., Inc.**
Block 16
1801 Evans Street
San Francisco, California.
Source: SFFD

The Circosta Iron & Metal Company utilizes bulk oxygen containers and acetylene cylinders for the operation of cutting torches. One 50-gallon above ground motor oil tank was also noted on the Circosta property during an SFFD site inspection conducted in December, 1987.

4.5 Hazardous Materials Sites

- o **Echo-West, Inc.**
Block 12
1500A Davidson Avenue
San Francisco, California.
Source: SFDPH

A site inspection conducted by the SFDPH in January of 1989 noted the on-site storage of adhesives, enamel, plaster, oxygen cylinders and acetylene cylinders.

4.6 Hazardous Waste Sites

No hazardous waste sites listed in the EPA NPL were located in the vicinity of the study area. Three CERCLIS sites were noted in the vicinity of the Project site. The sites identified were:

- 1) **EPA I.D. No. CAD980736052**
Armstrong James Vacant Lot,
2250 Jerrold Avenue, San Francisco;
- 2) **EPA I.D. No. CAD980637011**
Islais Creek Area,
(Pier 94 area), San Francisco;
- 3) **EPA I.D. No. CA5180090362**
US Postal Service Vehicle Maintenance,
1300 Evans Avenue, San Francisco.

However, these sites are situated outside the designated study area and do not appear to pose a direct environmental impact on the Project site. Additionally, the RWQCB list of "Waste Disposal Sites and Waste Accepted at the Sites" indicated that no waste disposal site are located in the Study area.

5.0 SUMMARY OF FINDINGS

5.1 Summary of Site Walk-through Observations

A site walk-through was conducted to provide a preliminary assessment of potential hazardous materials and hazardous waste sources in the study area. Based on these visual observations, a summary of facilities and/or features which may impact the environmental conditions at the Project site are presented below.

BLOCK NUMBER: 1

APN: 5272

Location: None

Facility/Feature:
No significant features observed.

Potential Environmental Concerns:
No significant environmental concerns noted from site walk observations.

BLOCK NUMBER: 2

APN: 5260

Location: Northeast corner of Phelps Street and Innes Avenue

Facility/Feature:
Soil Stockpile

Potential Environmental Concerns:
Unknown due to the unidentifiable constituents of the soil stockpile.

BLOCK NUMBER: 3

APN: 5253

Location: 1695 Galvez Avenue (corner of Galvez Avenue and Phelps Street)

Facility/Feature:
Refrigerator Storage Facility, formerly Keystone Batteries Inc.

Potential Environmental Concerns:
Historical land usage includes a battery manufacturing facility.
Currently, a refrigerator storage facility occupies the parcel.

1514F: 1514R

Geo/Resource Consultants, Inc.

BLOCK NUMBER: 4

APN: 5242

Location: None.

Facility/Feature:
No significant features observed.

Potential Environmental Concerns:
No significant environmental concerns noted from site walk observations.

BLOCK NUMBER: 5

APN: 5235

Location: 3800 Third Street.

Facility/Feature:
UNOCAL Gasoline Station.

Potential Environmental Concerns:
Above ground storage containers observed (55-gallon) on-site.

BLOCK NUMBER: 6

APN: 5225

Location: 3750 Third Street.

Facility/Feature:
Xtra Oil Company/Shell Self Serve Station.

Potential Environmental Concerns:
No significant environmental concerns noted from site walk observations.

BLOCK NUMBER: 7

APN: 5203

Location: None.

Facility/Feature:

No significant features observed.

Potential Environmental Concerns:

No significant environmental concerns noted from site walk observations.

BLOCK NUMBER: 8

APN: 5211

Location: 3550 Third Street

Facility/Feature:

Fender House, an automobile salvage and scrap metal storage yard.

Potential Environmental Concerns:

Oil staining observed at salvage yard entrance on Custer Avenue.

BLOCK NUMBER: 9

APN: 5217

Location: 1495 Custer Avenue (fenced area)

Facility/Feature:

Former McKesson Chemical Warehouse, two 55-gallon unlabeled containers noted.

Potential Environmental Concerns:

Unknown due to the undetermined nature of operations conducted at the former McKesson Chemical facility and the undetermined contents of the 55-gallon containers.

BLOCK NUMBER: 10

APN: 5226

Location: Vacant Lot behind 1698 Evans Avenue

Facility/Feature:

Oil staining located in the lot and small puddle of oil observed in lot area.

Potential Environmental Concerns:

Possible soil contamination caused by improper waste oil disposal.

BLOCK NUMBER: 11

APN: 5212

Location: None.

Facility/Feature:

No significant features observed.

Potential Environmental Concerns:

No significant environmental concerns noted from site walk observations

BLOCK NUMBER: 12

APN: 5216

Location: None.

Facility/Feature:

No significant features observed.

Potential Environmental Concerns:

No significant environmental concerns noted from site walk observations.

BLOCK NUMBER: 13

APN: 5227

Location: Length of Block 13 along Evans Street towards Davidson Avenue.

Facility/Feature:

All Auto Dismantlers, Inc., automobile salvage and wrecking yard.

Potential Environmental Concerns:

Possible soil contamination from disposal of waste oils, automobile lubricants and/or petroleum products resulting from engine dismantling and salvaging operations.

BLOCK NUMBER: 14

APN: 5215

Location: 2 Rankin Street.

Facility/Feature:

ABC Auto Parts and American Diesel.

Potential Environmental Concerns:

Possible use of petroleum and diesel products.

BLOCK NUMBER: 15

APN: 5228

Location: Block 15 (entire).

Facility/Feature:

AC Auto Wreckers and Radiator Shop, automobile wrecking and storage yard. DPW Industrial Waste Sampling unit noted on Rankin Street.

Potential Environmental Concerns:

Automobile parts and heavy oil staining noted at yard entrance on Davidson Avenue.

BLOCK NUMBER: 16

APN: 5232

Location: 1801 Evans Avenue, west of Southeast WPCP.

Facility/Feature:

Circosta Iron and Metal Company, large automobile wrecking facility.

Potential Environmental Concerns:

Possible contaminants may include automobile lubricants, petroleum products and waste oils resulting from on-site wrecking operations.

BLOCK NUMBER: 17

APN: 5262

Location: None.

Facility/Feature:

No significant features observed.

Potential Environmental Concerns:

No significant environmental concerns noted from site walk observations.

5.2 Summary of Aerial Photograph Review

The prominent changes noted during the aerial photograph review included rapid growth of scrap metal yards, automobile wrecking yards, and warehouses located along the perimeter of the existing Southeast WPCP during the 1950's and 1960's. Scrap metal and wrecking yard areas were observed in the majority of the photographs reviewed. These additional operations appeared subsequent to the activities noted at the salvage yard located on the triangle-shaped parcel bounded by Rankin Street, Evans Avenue and SP. During the late 1960's and 1970's these yards and/or other yards expanded eastward. However, the most prominent scrap yard is the triangular parcel which has been actively processing scrap metal since 1958 (discussed in the 1958 narrative) and is presently in operation.

In the late 1970's and early 1980's, a gradual encroachment of Southeast WPCP construction was noted on the Project site, progressing from the east toward the west and forming the existing Southeast WPCP configuration.

Prominent, potential contaminant sources noted during the aerial photograph review included: two gasoline service stations, two vehicle repair shops, three possible above

ground storage tank sites, and two aeration pond sites. The following outline indicates the facility discussed, the approximate location, and the time span in which the subject feature was observed in the aerial photographs. The following outline does not encompass all potential contaminant sources which may be represented in the Project area. Rather, the most significant potential contaminant sources that may impact the Project site are presented below:

- 1. Above Ground Storage Tank**
Location: Vicinity of secondary clarifiers 2 and 3
Time Span: 1935 to 1948
- 2. Twenty One Aeration Ponds**
Location: Proximity of present-day secondary clarifiers 5, 9, 6, and 10.
Time Span: 1935 to 1948
- 3. Two Possible Above Ground Storage Tanks**
Location: Proximity of present-day primary treatment plant.
Time Span: 1948 to 1958
- 4. Above Ground Storage Tank**
Location: East side of Davidson Avenue between Rankin and Quint Streets.
Time Span: 1948 to 1958
- 5. Four Above Ground Storage Tanks**
Location: Corner of Rankin Street and Islais Street.
Time Span: 1955 to 1961
- 6. Gasoline Station**
Location: South of the intersection of Arthur Avenue and Quint Street, bordered by Third Street.
Time Span: 1958 to 1975
- 7. Gasoline Station**
Location: Immediately west of Third Street and Evans Avenue intersection.
Time Span: 1958 to 1969
- 8. Large Vehicle Repair/Filling Station**
Location: Proximity of present-day central shops.
Time Span: 1958 to 1961
- 9. Eleven Aeration Ponds**
Location: Vicinity of present-day secondary clarifiers 7 and 8.
Time Span: 1958 to 1969
- 10. Vehicle Repair Building**
Location: Present-day administration and maintenance building.
Time Span: 1961 to 1977
- 11. Gasoline Station**
Location: Between Davidson and Evans Avenue on Third Street.
Time Span: 1969 to present

5.3 Summary of Sanborn Insurance Map Review

Tables 1 to 5 presented in Section 3.2, Sanborn Insurance Map Review, indicate sites which may be potential contaminant sources. However, thirteen significant sites were selected from these tables and presented in this summary. The following outline indicates the facility discussed, the location, and the time span in which the subject site was dated on the Sanborn Insurance Maps.

The following outline does not note all of the potential contaminant sources, rather, thirteen significant potential contaminant sources selected from the tables presented in Section 3.2. The outline is presented in chronological order.

- 1. Glue Plant**
Block: 16
Time Span: 1914 to 1929
- 2. Lumber Yard**
Block: 11
Time Span: 1929 to pre-1965
- 3. Lumber Storage/Milling**
Block: 13
Time Span: 1929 to post-1965
- 4. Scrap Metal Yard**
Block: 16
Time Span: 1942 to Present
- 5. Gasoline Storage Area**
Block: 17
Time Span: 1942 to pre-1965
- 6. Battery Manufacture**
Block: 3
Time Span: 1942 to 1965
- 7. Foundry**
Block: 4
Time Span: 1942 to post-1965
- 8. Gasoline Station(s)**
Block: 5
Time Span: 1942 to 1988
- 9. Oil Storage in Steel Drums**
Block: 1
Time Span: 1965 to 1988

10. **Oil Storage Yard/Gasoline Station**
Block: 4
Time Span: 1965 to 1988
11. **Auto Parts/Auto Wrecking Facility**
Block: 2
Time Span: Approximately 1985 to 1988
12. **Flammable Chemical Storage**
Block: 9
Time Span: 1988 to Present (?)
13. **Asbestos Production**
Block: 12
Time Span: 1988 to Present (?)

5.4 Summary of Hazardous Materials and Hazardous Waste Record Review

Each facility discussed in the Hazardous Materials and Hazardous Waste Record Review (Section 4.0) is addressed in the summary below. Although numerous light industrial and heavy industrial facilities were noted during the site walk-through observations (See Section 2.4), the information presented in Section 4.0 is limited to the availability of data at the environmental agencies contacted.

The information summarized below for each facility includes: the block number location of the facility corresponding to Figure 2; the business address of the facility; the name or description of the facility; the potential environmental impacts resulting from historical and/or current operations and land usage; and the status of the contamination or potential impact, and the significance of the impact to the proposed Project site.

BLOCK NUMBER: 3

Location: 1695 Galvez Street

Facility/Feature:
Refrigerator Storage Facility

Potential Environmental Concerns:
Historical battery manufacturing (also noted in Section 3.2, Table 3), one underground storage tank maintained during occupation by Keystone Battery Inc. Currently, a refrigerator storage facility.

Potential Impact:
Impact may be posed to the immediate vicinity surrounding the facility. However, direct contaminant impact to the Project site may be less significant due to the northeast groundwater flow in the study area.

1514F: 1514R

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BLOCK NUMBER: 5

Location: 3800 Third Street

Facility/Feature:
UNOCAL Service Station #0426

Potential Environmental Concerns:
Historical leaking underground storage tank and subsurface soil and groundwater contamination.

Potential Impact:
Based on the conditions in the study area, and the northeast direction of groundwater flow, impact from the UNOCAL site to the Project site appears to be limited.

BLOCK NUMBER: 6

Location: 3750 Third Street

Facility/Feature:
Xtra Oil Company/Shell Self Serve Station

Potential Environmental Concerns:
Underground storage tanks. No leaks documented, tank integrity tests indicate tightness of tanks.

Potential Impact:
Based on the information reviewed, the Shell Service Station does not appear to pose an environmental threat to the Project site.

BLOCK NUMBER: 9

Location: 1495 Custer Avenue

Facility/Feature:
Food Storage Warehouse/Former McKesson Chemical Company

Potential Environmental Concerns:
Historical above ground storage tank ("gas buggy").

Potential Impact:
The previous maintenance of one above ground storage tank at the facility may not significantly affect the environmental conditions of the Project site. Based on the limited information provided regarding the former McKesson Chemical Company, potential environmental impact possibly caused by historical operations at the site can not be thoroughly assessed at this time.

BLOCK NUMBER: 9

Location: 3600 Third Street

Facility/Feature:
Peeters Transportation Co., Inc.

Potential Environmental Concerns:

Maintenance of propane containers on-site. No documentation of the underground storage tanks maintained on-site (above ground dispensers noted during site walk-through) provided.

Potential Impact:

Potential impact can not be assessed due to lack of information regarding the underground storage tanks.

BLOCK NUMBER: 10

Location: 1690 Evans Avenue

Facility/Feature:
Bayox Welding Equipment & Gases

Potential Environmental Concerns:

Previous underground tank removal, results of the soil and groundwater sample analyses not available in SFDPH records.

Potential Impact:

Potential impact can not be assessed due to lack of information regarding the underground storage tank.

BLOCK NUMBER: 10

Location: 1698 Evans Street

Facility/Feature:
San Francisco Door Company

Potential Environmental Concerns:

Previous maintenance of one underground storage tank containing petroleum product. Lack of data documenting the removal and/or abandonment of the tank.

Potential Impact:

Potential impact can not be assessed due to lack of information regarding the underground storage tank.

1514F: 1514R

Geo/Resource Consultants, Inc.

BLOCK NUMBER: 12

Location: 1500A Davidson Avenue

Facility/Feature:
Echo-West, Inc.

Potential Environmental Concerns:

On-site storage of hazardous materials including adhesives, enamel, plaster, oxygen and acetylene.

Potential Impact:

The impact of hazardous materials stored at the Echo-West facility appears minimal due to the limited quantities stored on-site.

BLOCK NUMBER: 16

Location: 1801 Evans Street

Facility/Feature:
Circosta Iron & Metal Co., Inc.

Potential Environmental Concerns:

Historical leaking underground storage tank, extent of contamination resulting from tank leak undetermined based on available records. Installation of one underground storage to replace the leaking tank. Current status of the replacement tank not documented. Maintenance of oxygen and acetylene cylinders and one above ground motor oil storage tank.

Potential Impact:

Possible contamination occurring from on-site operations at the Circosta Iron & Metal facility may potentially impact the Southeast WPCP and the proposed Southeast WPCP expansion since the Project site is located downgradient of the Circosta facility.

BLOCK NUMBER: 17

Location: 750 Phelps Street

Facility/Feature:
Southeast Water Pollution Control Plant

Potential Environmental Concerns:

Historical leaking underground storage tank (diesel). Total petroleum hydrocarbons detected at 340 ppm. Installation of groundwater monitoring wells conducted in August 1988. Soil and groundwater samples collected for TPH (in soil only) and BTXE analyses.

Potential Impact:

Based on the investigation completed by ERM-West in August 1988, the extent of soil contamination on-site may be minimal. The results of the groundwater analyses conducted by Anlab indicate that ground water was not contaminated by diesel products.

6.0 CONCLUSIONS

A Site History Review was completed for the proposed Islais Creek Pump Station Project expansion at the Southeast Water Pollution Control Plant (Southeast WPCP). The Report was prepared in accordance with the regulations referenced in Article 20 of the San Francisco Department of Public Works Code, Analyzing The Soil For Hazardous Wastes.

The contents of this Report and the investigative procedures implemented during this Report have been conducted in accordance with standard methodology practiced in this industry at this time. No other warranty is hereby or otherwise implied. Additionally, during the course of the Site History Review, no samples have been collected and/or analyzed by GRC for chemical constituents or physical properties and were not requested as part of the Scope of Work.

Based on the data reviewed for the Site History Review, potential sources of hazardous materials and hazardous waste contamination from historical and/or existing facilities are evident in the study area. Environmental impact and/or human health risks from these sources cannot be evaluated until further investigations are conducted. In accordance with Section 1002 (Soil Sampling and Analysis) of San Francisco Public Works Code Article 20, Analyzing the Soil For Hazardous Wastes, a sampling plan will be prepared following the completion of the Site History Review. The information provided in the Site History Review will be referenced in the proposed Sampling Plan.

The following sections present the findings from the Site Walk-through Observations, Aerial Photograph Review, Sanborn Insurance Map review, and the Hazardous Materials and Hazardous Waste Record Review. The compilation of information is presented by the block numbers designated by GRC. Figure 4 depicts the approximate locations of each facility addressed.

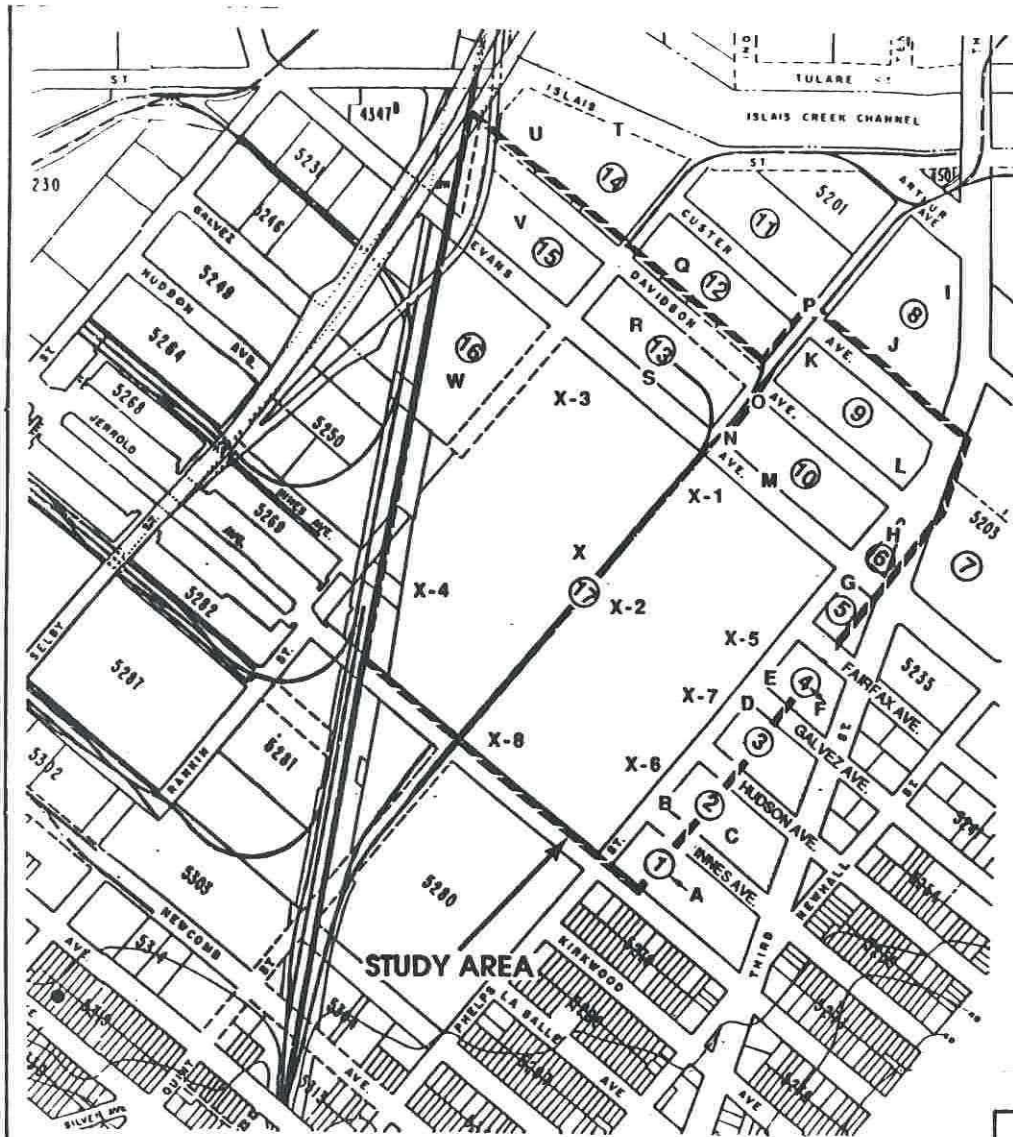
BLOCK 1

The existence of steel containers for oil storage was noted in the Sanborn Insurance Map review between years 1965 to 1988. No additional information was revealed during the records review. (See Figure 4, Item A).

Potential contamination resulting from the previous oil storage appears to pose minimal threat to the environmental conditions at the Project site based on the northeast groundwater flow in the immediate vicinity. However, environmental impact cannot be demonstrated with the information provided.

BLOCK 2

During the site walk-through, a soil stockpile was noted. The constituents of the stockpile and the condition of the soil could not be determined from visual observations. (See Figure 4, Item B).



Reference: Planning Department, City & County of San Francisco

LEGEND

- A OIL STORAGE
- B SOIL STOCKPILE
- C AUTO PARTS/AUTO WRECKING FACILITY
- D REFRIGERATOR STORAGE FACILITY (formerly Keystone Batteries, Inc.)
- E FOUNDRY
- F OIL STORAGE YARD/GASOLINE STATION
- G UNOCAL SERVICE STATION
- H XTRA OIL COMPANY/SHELL SELF SERVICE STATION
- I FORMER GASOLINE STATION
- J THE FENDER HOUSE
- K FORMER MCKESSON CHEMICAL WAREHOUSE
- L PEETERS TRANSPORTATION COMPANY
- M BAYOX WELDING EQUIPMENT & GASES
- N SAN FRANCISCO DOOR COMPANY (formerly Buckley Door Company)
- O VACANT LOT
- P LUMBER STORAGE/SAILING OPERATION
- Q ASBESTOS PRODUCTION FACILITY
- R LUMBER YARD OPERATIONS
- S ALL AUTO DISMANTLERS, INC.
- T FISH PACKING WAREHOUSE
- U ABC AUTO PARTS
- V AC AUTO WRECKERS AND RADIATOR SHOP
- W CIRCOSTA IRON AND METAL COMPANY
- X SOUTHEAST WATER POLLUTION CONTROL PLANT
- X-1 ABOVE GROUND STORAGE TANK (1935 to 1948)
- X-2 TWENTY ONE AERATION PONDS (1935 to 1948)
- X-3 TWO POSSIBLE ABOVE GROUND STORAGE TANKS (1948 to 1958)
- X-4 LARGE VEHICLE REPAIR/FILLING STATION (1958 to 1981)
- X-5 ELEVEN AERATION PONDS (1958 to 1989)
- X-6 VEHICLE REPAIR BUILDING (1961 to 1977)
- X-7 GASOLINE STORAGE AREA (1942 to pre-1985)
- X-8 REMOVED UNDERGROUND STORAGE TANK (1988)

NOTE: LOCATIONS ARE APPROXIMATE



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Job No. 1514-00 Appr. *[Signature]* Date 12/18/89

FACILITY LOCATION MAP
Isais Creek Pump Station Project
Southeast Water Pollution Control Plant
San Francisco, California

FIGURE

4

Potential contamination resulting from the stockpile may pose a minimal threat to the environmental conditions at the Project site, however, the environmental impact of the soil stockpile cannot be demonstrated with the information provided.

Located east of the soil stockpile, an auto parts storage/auto wrecking operation was identified in the Sanborn Insurance Map Review. This facility, located outside the designated study area, was not noted during the site walk-through observations. (See Figure 4, Item C).

Potential contamination resulting from the auto wreckage operations may pose a minimal threat to the environmental conditions at the Project site, however, the environmental impact of the facility cannot be demonstrated with the information provided.

BLOCK 3

The refrigerator storage facility observed during the site walk-through is identified in the Hazardous Materials and Hazardous Waste Record and Sanborn Insurance Map Review as the former location of the Keystone Battery Inc. operation. Keystone Battery Inc., a battery manufacturer, occupied the property from approximately 1942 to 1965. No further information regarding the specific hazardous materials stored and/or used by Keystone Batteries, Inc. was documented in the records reviewed. (See Figure 4, Item D).

Potential contamination occurring at the facility due to historical and/or present on-site operations may present environmental concerns to the immediate vicinity of the refrigerator storage facility including portions of the Project site. However, the environmental impact from historical and current land usage cannot be demonstrated with the limited information provided.

BLOCK 4

A foundry (exact name not specified on the Sanborn Maps) was also identified on Block 4 during the Sanborn Map Review. The foundry appeared to operate from that location between 1942 to 1965. (See Figure 4, Item E). Due to the limited historical hazardous materials information available regarding the foundry operations, the environmental impact from historical land usage at this site cannot be demonstrated with the information presented.

The Sanborn Insurance Map Review identified an oil storage yard/gasoline station operating on Block 4 from approximately 1965 to 1988. However, a review of aerial photographs and hazardous materials records did not identify the oil storage yard/gasoline station. (See Figure 4, Item F).

Potential contamination occurring from the facility appears to pose minimal threat to the environmental conditions at the Project site, however, the environmental impact from the oil storage yard/gasoline station cannot be characterized by the information provided.

BLOCK 5

A gasoline station, identified during the site walk-through as a UNOCAL Service Station, has experienced unauthorized product releases from an excavated underground storage tank. Based on the information reviewed in the hazardous materials records, a groundwater monitoring program continues on-site. (See Figure 4, Item G).

Potential impacts due to the existence of contamination at the UNOCAL station appear to be limited based on the northeast groundwater gradient in the study area.

BLOCK 6

A Shell Self Serve Station, also referenced as Xtra Oil Company, occupies Block 6. The aerial photograph review noted a gasoline station at this location in the 1958 photographs and again in the 1969 photographs. Based on the hazardous material records reviewed, tank integrity tests have been conducted on the underground storage tanks maintained by the Shell Station. The results indicated that the tanks tested "light". (See Figure 4, Item H).

Based on the information reviewed regarding the condition of the underground storage tanks, the Shell Self Serve Station does not appear to present an environmental concern to the Project site at this time.

BLOCK 7

Based on the information reviewed, historical land usage and facilities currently occupying Block 7 do not appear to pose an environmental threat to the Project site.

BLOCK 8

A gasoline station, located south of the intersection of Arthur Avenue and Quint Street, was noted in the 1958 aerial photograph narrative. According to the aerial photograph review, the facility operated from this location until 1975. (See Figure 4, Item I).

Based on the location of the former gasoline station, potential contamination occurring at the property appears to pose minimal threat to the environmental conditions at the Project site. However, the environmental impact from the previous operations to the Project site cannot be demonstrated with the information provided. The Fender House, an auto wrecking yard, is located along the southern portion of Block 8. Oil stains were observed on the surface soil at the salvage yard entrance. Hazardous materials information was not documented with the local environmental agencies contacted. (See Figure 4, Item J).

Potential contamination occurring at the facility may present an environmental concern to the Project site. The environmental impact of the Fender House operation cannot be demonstrated based on the limited information provided.

BLOCK 9

A "flammable chemical storage warehouse", described in the 1988 Sanborn Insurance Map, was identified during the site walk-through as the McKesson Chemical Warehouse. A sign affixed to a cyclone fence noted the former location of the chemical warehouse. Two unlabeled 55-gallon containers were observed inside a cyclone-fenced area. The specific types of chemicals stored, manufactured and/or used at the facility while in operation could not be identified due to the limited information found during the records review. (See Figure 4, Item K).

Potential contamination resulting from McKesson Chemical Warehouse operations may impact the environmental conditions at the Project site. The Sanborn Insurance Map Review noted that the facility was a "Flammable Chemical Warehouse", this limited information does not provide adequate evidence to determine the environmental impact of the McKesson operation.

Above ground dispensers were observed in the van storage and maintenance area at Peeters Transportation Company. The dispensers indicate the possible existence of underground storage tanks. Agency records did not contain information regarding the maintenance of underground storage tanks by the Peeters Transportation Company. (See Figure 4, Item L).

The environmental impact of potential contamination occurring at the facility cannot be demonstrated with the information provided.

BLOCK 10

The Bayox Welding Equipment & Gases facility removed one underground storage tank from the property in March of 1989. Records documenting soil and/or groundwater sample analyses were not found in agency files. (See Figure 4, Item M).

The environmental impact of potential contamination resulting from the removal of the underground tank cannot be determined based on the information provided.

The San Francisco Door Company, formerly the Buckley Door Company, previously maintained one underground storage tank. Agency records reviewed did not include documentation regarding the removal and/or abandonment of the tank. (See Figure 4, Item N).

Based on the information provided, the environmental impact of potential contamination occurring at the San Francisco Door Company cannot be determined. Surface oil stains and a small accumulation (puddle) of waste oil was observed on a vacant lot located on Davidson Avenue, behind the San Francisco Door Company. Review of records could not determine historical land usage at the site. (See Figure 4, Item O).

The environmental impact from the vacant lot to the Project site cannot be demonstrated with the limited information provided.

BLOCK 11

A lumber storage and milling operation was noted during the Sanborn Insurance Map Review. The facilities operated on Block 11 from 1929 to pre-1965. (See Figure 4, Item P).

Based on the limited information reviewed, the environmental impact resulting from lumber storage and milling operations on Block 11 can not be ascertained.

BLOCK 12

A 1988 Sanborn Insurance Map indicated the existence of an asbestos production facility outside the designated study area on Block 12. The name of the facility was not indicated on the map reviewed. Hazardous material information was not available for review. (See Figure 4, Item Q).

Based on the available information, the environmental impact of potential contamination resulting from the asbestos production facility on the Project site cannot be determined.

BLOCK 13

Various lumber yard operations and lumber storage companies occupied Block 13 between 1929 and post-1965. However, the environmental impact of these historical operations on the Project site can not be ascertained due to the limited available data. (See Figure 4, Item R).

All Auto Dismantlers, Inc. is located along the southern portion of Block 13. Hazardous materials and hazardous wastes information regarding the auto wrecking facility was not available in the agency records, therefore potential environmental impacts on the Project site cannot be determined. (See Figure 4, Item S).

BLOCK 14

Four above ground storage tanks were noted on the fish packing facility in the 1955 aerial photographs. The four tanks, located on the northern portion of the block, existed at that location from approximately 1955 to 1961. Contents of the tanks could not be discerned from the photographs. (See Figure 4, Item T).

The environmental impact of potential contamination resulting from the maintenance of the four above ground tanks cannot be assessed based on the limited information provided.

ABC Auto Parts is located on the southwest portion of Block 14. American Diesel, a truck and bus repair operation, is also located on the ABC Auto Parts property. (See Figure 4, Item U).

The environmental impact of potential hazardous waste contamination resulting from ABC Auto Parts and/or American Diesel cannot be assessed based on the limited information provided.

BLOCK 15

The AC Auto Wreckers and Radiator Shop occupies Block 15. Heavy oil staining was observed on-site. Hazardous materials and hazardous waste information were not documented in the agency files. (See Figure 4, Item V).

Potential contamination resulting from on-site operations may affect the Project site based on the proposed areas of WPCP expansion. However, the environmental impact from the facility cannot be demonstrated from the limited information.

BLOCK 16

Circosta Iron and Metal Company occupies Block 16, west of the existing Southeast WPCP. Historical land usage included the operation of a glue plant noted in the 1914 Sanborn Insurance Map. The scrap metal operation was originally noted at the present location in 1942. An historical leaking underground storage tank was removed and replaced in 1965. Soil analyses, if conducted during the removal activities, were not documented in agency records. Additionally, the status of the replacement tank was not documented in the files. (See Figure 4, Item W).

Due to the proximity of the Circosta facility to the Project site, potential contamination resulting from the Circosta operation may pose a threat to the environmental conditions at the Project site. However, the environmental impact from the facility cannot be demonstrated based on the information provided.

BLOCK 17

The Southeast Water-Pollution Control Plant occupies the entire Block 17. Historical land usage on various portions of the existing facility include: maintenance of one above ground storage tank (Item X-1), twenty one aeration ponds (Item X-2), two possible above ground storage tanks (Item X-3), a large vehicle repair/filling station (Item X-4), eleven aeration ponds (Item X-5), a vehicle repair building (Item X-6), and a gasoline storage area (Item X-7). In 1988, a leaking underground diesel tank was removed from an area located in the southeast portion of the Southeast WPCP along Jerrold Avenue (Personal communication, Mr. Stanford Snoek, Department of Public Works, Industrial Waste Division, November 6, 1989) (Item X-8).

Based on the hazardous materials information reviewed, contamination resulting from the removed underground tank at the Southeast Water Pollution Control Plant has impacted subsurface soil conditions at the Project site. The laboratory analyses results presented in the ERM-West report, indicate that ground water does not appear to be impacted from the leaking UST. However, based on the limited monitoring frequency (one time-August 1988) and the shallow depth to ground water (approximately 11 to 12.5-feet), impact from petroleum contaminants in the ground water cannot be fully evaluated.

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Pacific Aerial Surveys, Stereo-paired Aerial Photographs, (black and white):

Photo LD. #	Scale	Date
AV-248-05-01.03	Scale 1" = 1800'	Dated 1935.
AV-248-06-03.04	Scale 1" = 1800'	Dated 1935.
AV-17-12-11, 13	Scale 1" = 600'	Dated 7-28-48.
AV-170-08-10	Scale 1" = 600'	Dated 5-5-55.
AV-279-10-10,12	Scale 1" = 600'	Dated 4-23-58.
AV-432-07-07,08	Scale 1" = 1000'	Dated 6-20-61.
AV-933-07-06,	Scale 1" = 1000'	Dated 10-30-69.
AV-1045-07-08	Scale 1" = 1000'	Dated 5-10-72.
AV-1188-06-08,09	Scale 1" = 1000'	Dated 5-12-75.
AV-1356-07-05	Scale 1" = 1000'	Dated 6-2-77.
AV-1705-06-09	Scale 1" = 1000'	Dated 5-30-79.
AV-2020-06-08,10,11	Scale 1" = 1000'	Dated 6-19-81.
AV-2265-06-07,08	Scale 1" = 1000'	Dated 6-6-83.
AV-2670-06-08,10	Scale 1" = 1000'	Dated 10-14-85.
HAP 1051, 1053	Scale 1" = 5000'	Dated 8-17-88.
AV-3556-06-08,09	Scale 1" = 1000'	Dated 5-30-89.
AV-3556-07-10,11	Scale 1" = 1000'	Dated 5-30-89.

ATTACHMENT 3
***EXCERPT OF "FINAL
SOIL/GROUNDWATER
INVESTIGATION REPORT,
ISLAIS CREEK PUMP STATION
PROJECT," GEO/RESOURCE
CONSULTANT INC.
AUGUST 1990***

Report

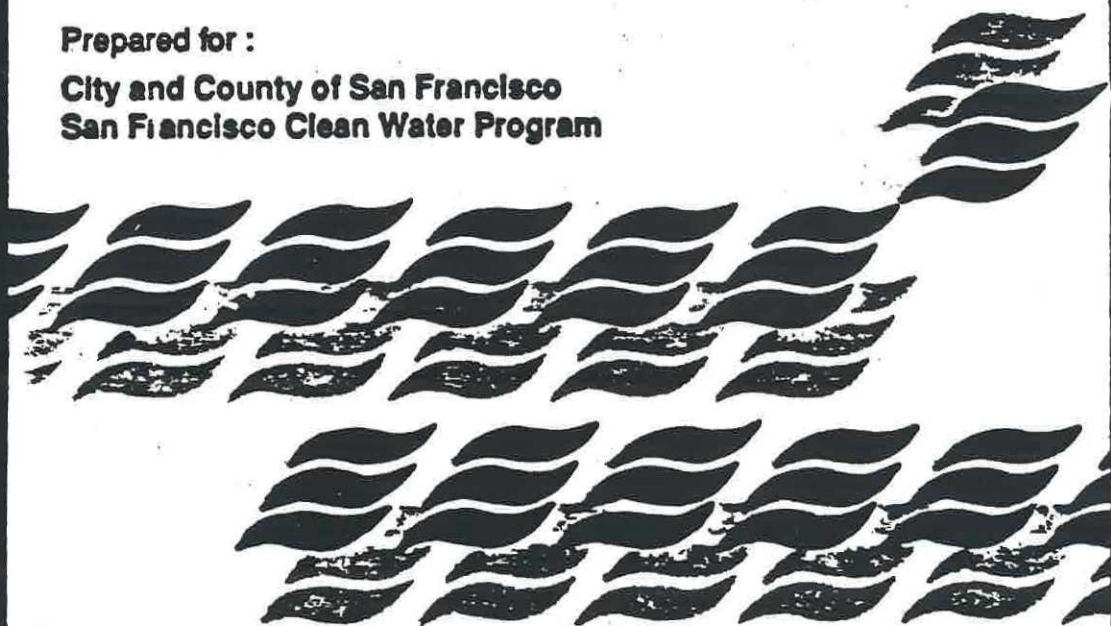
1514-00-2

**Final Soil/Groundwater Investigation Report
Islais Creek Pump Station Project
San Francisco, California**

August 1990

Prepared for :

**City and County of San Francisco
San Francisco Clean Water Program**



Geo/Resource Consultants, Inc.

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August 24, 1990
1514-002-00

Mr. Steven Medbery
SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS
Industrial Waste Division
750 Phelps Street
San Francisco, California 94124

RE: SOIL/GROUNDWATER INVESTIGATION REPORT
ISLAIS CREEK PUMP STATION PROJECT
SAN FRANCISCO, CALIFORNIA

Dear Mr. Medbery:

Geo/Resource Consultants, Inc. (GRC) is pleased to submit the attached Final Soil/Groundwater Investigation Report for the aforementioned project. We refer you to the contents of the Report for details.

If you have any questions regarding the Report or any aspect of the project, please feel free to give me a call. Thank you for your continued support.

Sincerely,
GEO/RESOURCE CONSULTANTS, INC.

Eva E. Vanek
Project Hydrogeologist

Gregory T. Carbullido, R.E.A.
Principal, Environmental Programs Division

EEV/GTC/ADT:edg

cc Mr. Stanley Desouza, Department of Public Work (4 copies)
GRC Project File, 1514-002-00

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Senior Vice President

CDG1: 1514-L

SOIL/GROUNDWATER INVESTIGATION REPORT

ISLAIS CREEK PUMP STATION PROJECT

SAN FRANCISCO, CALIFORNIA

PREPARED FOR:

CITY AND COUNTY OF SAN FRANCISCO

SAN FRANCISCO CLEAN WATER PROGRAM

PREPARED BY:

GEO/RESOURCE CONSULTANTS, INC.

851 HARRISON STREET

SAN FRANCISCO, CALIFORNIA 94107

AUGUST, 1990

JOB NUMBER: 1514-00-2

Geo/Resource Consultants, Inc.

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1.0 INTRODUCTION

The San Francisco Clean Water Program (SFCWP) is currently evaluating the potential for installing a new Islais Creek Pump Station and associated pipelines in association with the existing Southeast Water Pollution Control Plant at 750 Phelps Avenue in San Francisco, California (See Figure 1). The project will require subsurface excavation, thus, the SFCWP must comply with Part II, Chapter 10, Article 20 of the San Francisco Municipal Code (Maher Ordinance). The Maher Ordinance states that a "site history for the property be prepared" and that soil sampling and analyses be conducted for "a construction project that involves the disturbance of at least 50 cubic yards of soil and; the parcel of land...is located bayward of the high-tide line as indicated on the Historic San Francisco Maps..." (Article 20, Sections 1001 and 1002).

Section 1002 of the Maher Ordinance provides a list of analyses or analytical parameters that should be conducted on soil samples collected from proposed zones of excavation. Section 1008(e) of the Maher Ordinance states that additional analyses, outside of those parameters indicated in Section 1002, should be conducted to address potential contamination resulting from historical and current site usage.

1.1 PROJECT BACKGROUND

The SFCWP, under the auspices of the San Francisco Department of Public Works-Industrial Waste Division (SFDPW), retained Geo/Resource Consultants, Inc. (GRC) to conduct a "Site History Review" (December 18, 1989). The Site History Review delineated potential contaminant sources in the vicinity of the proposed Islais Creek Pump Station facilities (referred to herein as the Islais Creek Pump Station site).

Based on findings presented in the Site History Review and Maher Ordinance requirements, GRC submitted a Sampling and Testing Plan (Plan) to the SFDPW in January of 1990. The Plan presented recommendations and proposed methodologies for implementing a drilling and laboratory investigative program for Islais Creek Pump Station site. The SFDPW provided GRC with comments on the Plan and a revised Sampling and Testing Plan was implemented in March, 1990.

1.2 SCOPE OF WORK

The Scope of Work presented in the revised Plan was conducted under the direct supervision of a California Registered Geologist, and consisted of the following activities:

- 1) Utility Clearance
- 2) Drilling and sampling of fourteen (14) soil borings
- 3) Installation and sampling of one (1) groundwater monitoring well and sampling of one (1) existing groundwater monitoring well
- 4) Testing of soil and groundwater samples using the following analytical methods:

Title 26 Metals	(EPA Method 6010)
PCBs	(EPA Method 8080/608)
pH	(EPA Method 9040)
Flammability	(EPA Method 1010)
Cyanides	(EPA Method 9010)
Sulfides	(EPA Method 9030)
Volatile Organics	(EPA Method 8240/624)
Semi-volatile Organics	(EPA Method 8270/625)
Aromatic Volatile Organics	(EPA Method 8020/602)
Semi-volatile Organics	(EPA Method 8010/601)
TPH - Diesel	(EPA Method 8015, modified)
TPH - Gasoline	(EPA Method 8015, modified)
- 5) Preparation of a Report that describes project methodologies, findings and interpretations for the purpose of characterizing chemical contaminants in the subsurface.

2.0 INVESTIGATIVE METHODOLOGY

2.1 PRE-FIELD ACTIVITIES

Based on the information provided by SFDPW for the Site History Review (GRC, 1989), the proposed pipeline locations for the Islais Creek Pump Station Project are planned to underlie City streets. Thus, a majority of the borings planned for this investigation were drilled within City streets. As required, prior to drilling, Encroachment Permits for drilling in the streets were obtained by the SFCWP.

To prevent encountering subsurface utilities during drilling, GRC contacted Underground Service Alert (USA) in addition to contacting each utility company suspected of maintaining subsurface appurtenances near the proposed boring locations. These utility companies were supplied with a site sketch depicting proposed boring locations. Utility personnel responded by providing information regarding the location of subsurface appurtenances through written correspondences, telephone conversations and/or during field meetings. Several borings were re-located due to existing PG&E lines, fire auxiliary lines and/or sewer lines. A revised map indicating final boring locations was provided to the SFDPW prior to drilling (See Appendix A).

2.2 SOIL BORINGS

A total of fourteen, 8-inch-diameter soil borings were drilled at the Islais Creek Pump Station site using a hollow stem, continuous flight auger drill rig in March, 1990 (See Figure 2). Eight of the borings (B6, B7, B8, B9 (A and B), B10, B11, B12 and B14) were drilled on Rankin Street, Custer Avenue, Davidson Avenue and Phelps Avenue; one boring (B13) was drilled on the Southeast Water Pollution Control Plant (SEWPCP) property; one boring (B1) was drilled on ABC Auto Parts property; and four borings (B2, B3, B4 and B5) were drilled on the AC Auto Wrecker property (See Figure 2).

The borings were located within proposed zones of excavation, as required by the Maher Ordinance, and/or in the proximity of known or suspected contaminant sources identified in the Site History Review (GRC, December 1989). Table 1 lists the rationale for each boring location.

The borings were drilled to 13 to 18.5 feet below ground surface. These depths were selected to obtain samples of both fill and native materials. Borings were terminated near the top of the saturated zone to reduce the potential for ground water contamination by overlying contaminated soil. A groundwater monitoring well was installed in B3 at a depth of approximately 18 feet below ground surface. All of the borings were continuously lithologically logged, according to the Unified Soil Classification System, by a qualified hydrogeologist (See Appendix A). Logging was based on soil cuttings retrieved from the auger blades and from drive samples. All of the borings, with the exception of B3, were backfilled with cement grout upon completion of sampling.

The soil cuttings from the drilling operations are currently stored at the SEWPCP in 55-gallon, Department of Transportation (DOT) 17H Type drums. The drums were sealed and labeled according to their contents. A listing of the drums is provided in Appendix B.

2.3 SOIL SAMPLING

Soil samples were collected at approximate 5 to 10-foot intervals in each borehole. The samples were collected in 6-inch-long brass tubes inserted within a modified California drive sampler (2.5-inch-inside diameter). The sample tubes were labeled, logged on a Chain-of-Custody Record, covered with aluminum foil and plastic caps, sealed, and stored on ice to preserve sample integrity during transport to a State certified analytical laboratory. Excess soils from the sample barrels were field tested using a photoionization (Hnu) meter equipped with a 10.2 eV lamp to qualitatively determine the presence of hydrocarbon vapors (See Table 3 and Appendix A).

2.4 GROUNDWATER MONITORING WELL INSTALLATION

One, 2-inch-diameter groundwater monitoring well was installed in boring B3 to monitor potential groundwater contamination at AC Auto Wrecker. The groundwater monitoring well was constructed of Schedule 40 polyvinyl chloride (PVC) blank casing, 0.020-inch slotted screen casing and a screw-on well bottom plug. Ground water was encountered at approximately 6.5 feet below ground surface during drilling in boring B3. Thus, to accommodate potential water table fluctuations, 15 feet of screen was placed from approximately 3 feet below ground surface to the bottom of the boring at 18 feet. Blank casing was installed up to the ground surface. Following well installation, a graded sand pack (Lonestar, No. 3) was poured into the annular space of the groundwater monitoring well, approximately coincident with the top of the screen at 3 feet below ground surface. An approximately 1-foot-thick bentonite seal was placed above the sand pack and the remainder of the annular space was filled with cement grout. Organic sealing compounds were not used on the flush-threaded well casing.

The well construction was completed with a below-ground concrete vault and locking well cap. A well cover, installed above the ground surface to prevent ponding of surface water over the monitoring well, was placed over the well head. A diagram depicting well construction is included on the boring log for in Appendix A.

2.5 GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING

After allowing the annular seal to set for a minimum of 24 hours, groundwater monitoring well B3 was surged and bailed in order to increase the hydraulic connection between the filter pack and aquifer. Prior to development, the water level was recorded and a clear, acrylic bailer was lowered into the well to determine the presence of free hydrocarbon product at the surface of the water column. No detectable layers of free hydrocarbon product were noted in B3.

Groundwater monitoring well B3 was developed by bailing approximately 100 gallons of water. Ground water samples were collected during development in order to determine color and turbidity. These parameters were recorded during the well water extraction process in order to monitor well development. Well development data are presented in Appendix C. The development waters are currently stored in 55-gallon United States Department of Transportation (DOT), 17H Type drums at the SEWPCP.

Following well development, the groundwater monitoring well was allowed to reach equilibrium for three days before purging and sampling. In addition to sampling the well installed at B3, an existing monitoring well, MW1, located on the Unocal property at the corner of Phelps Avenue and Evans Street, was purged and sampled at the request of the SFDPW. At the time of sampling, construction information for MW1 was not available; however, field observations indicated that MW1 is approximately 40 feet deep with a casing diameter of 4 inches. Prior to purging, MW1 was checked for free hydrocarbon product, and none was observed.

Approximately 25 gallons of ground water (approximately 12 casing volumes) was purged from monitoring well B3 and approximately 70 gallons of water (approximately 3 casing volumes) were purged from groundwater monitoring well MW1. Electrical conductivity, pH and temperature of the purged waters were measured after each 5 to 10-gallon interval in order to collect representative ground water samples. Purge data were recorded and are included in Appendix D.

After purging, ground water samples were collected from B3 and MW1 using a clean Teflon bailer. Sample water was poured directly from the Teflon bailer into sample bottles provided by the analytical laboratory. Sample bottles were appropriately labeled, logged on a Chain-of-Custody Record, sealed, and placed on ice to preserve sample integrity for transport to the analytical laboratory. Purge water is currently stored at the SEWPCP in 55-gallon DOT, 17H Type drums.

2.6 LABORATORY ANALYSES

A total of three to four soil samples were collected from each boring drilled during this investigation. Based on field evidence, such as Hnu measurements and visual appearance, two soil samples per boring were selected and submitted for laboratory compositing. The soil samples were submitted to American Environmental Laboratories (AEL), a State certified analytical laboratory, for compositing and analyses.

Groundwater samples were collected from monitoring wells B3 and MW1 in sample containers provided by AEL as listed below:

<u>Analysis</u>	<u>Sample Container</u>
Metals	One - 1 liter plastic bottle (with nitric acid preservative)
Cyanide/Sulfide	One - 1 liter plastic bottle
Volatile Organics	Two - 40 ml VOA vials
Semi-volatile Organics	Two to three - 1 liter glass bottles
TPH - Diesel	One to three - 1 liter glass bottles
TPH - Gasoline	Two - 40 ml VOA vials

Soil and groundwater samples were submitted for chemical analyses based on site history information and Maher Ordinance requirements (See Tables 1 and 2). Maher Ordinance laboratory analyses requirements were met at locations within the historic tidal lines (B7, B8, B9, B10 and B11).

2.7 QUALITY ASSURANCE/QUALITY CONTROL

Field quality control objectives were met by implementing standardized sampling procedures based on protocol described in the California Department of Health Services (DHS) Site Mitigation Decision Tree (December, 1986), the Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Ground-Water Monitoring Technical Enforcement Guidance Document (September, 1986), and EPA Region IX Sampling Protocol (November, 1987). Examples of quality control procedures include daily calibration of an photoionization detector (Hnu), pH and conductivity meters.

Laboratory quality assurance objectives were met by conducting a data validation program, using duplicate and spiked samples to insure reproducibility and precision in chemical quantification. In addition, GRC submitted one "blind" duplicate and one blank sample for laboratory analyses (referred to as MW1A and MW1B, respectively). These samples were submitted for the same suite of analyses as the groundwater samples collected from MW1 and B3 (See Chain-of-Custody Records, Appendix F).

2.8 DECONTAMINATION PROCEDURES

To reduce the potential for cross-contamination, all hollow stem augers were steam-cleaned before drilling. The augers were steam-cleaned between borings on a trailer designed to collect the decontamination water. The decontamination water was then transferred to 55-gallon DOT, 17H Type drums, sealed, labeled and stored at the SEWPCP. Additionally, all components of the samplers, including brass tubes and hand augers, were cleaned with a non-phosphate soap (Liquinox) and double rinsed with distilled water after each sampling interval. The Teflon bailer used for groundwater sampling was also cleaned with Liquinox and double rinsed with distilled water between each sampling location.

3.0 INVESTIGATIVE FINDINGS

3.1 SOIL SAMPLING RESULTS

Two soil samples, collected from two discrete sampling depths at each of the fourteen borings, were composited by AEL prior to laboratory analyses. The composite sample was then analyzed in accordance to EPA Methods listed in Table 2. Results from these analyses are summarized in Tables 3, 4, 5, and 6 and the original laboratory data are presented in Appendix E.

3.1.1 Volatile Organics

Volatile organics, aromatic volatile organics and halogenated volatile organics were analyzed in accordance with EPA Methods 8240, 8020 and 8010, respectively. In general, EPA Method 8240 detects a wide range of organic compounds at relatively high detection limits, while EPA Methods 8010 and 8020 are commonly used to analyze selected organic compounds at lower detection limits. Historical site usage information presented in the Site History Review (GRC, December, 1989) provided the basis by which to select appropriate EPA Methods for samples collected from various locations across the site (See Tables 1 and 2). EPA Methods 8010 (halogenated volatile organics) and 8020 (aromatic volatile organics) were selected for samples collected from soil borings drilled in the proximity of previous fuel and/or solvent-related activities (B1, B3, B6, B12, B13 and B14). The remaining soil samples were submitted for EPA Method 8240 analyses primarily as a screening procedure. As presented in the Plan, samples collected from borings B4 and B5 were to be analyzed in accordance with EPA Methods 8010 and 8020. However, re-evaluation of current potential site activities at AC Auto Wreckers suggested that a wider range of analytical parameters (included in EPA Method 8240) may provide more representative data for the site. Thus, samples from B4 and B5 were submitted for EPA Method 8240 analyses.

With the exception of the soil sample collected from B14, constituents analyzed in accordance with EPA Methods 8010 and 8020 were not present above laboratory detection limits (See Table 3). The soil sample collected from B14 was found to contain toluene at 0.039 milligrams/kilogram (mg/kg).

The majority of the constituents analyzed in accordance with EPA Method 8240 were not found to be present above laboratory detection limits. Exceptions included: acetone, at 0.120 mg/kg and 0.110 mg/kg in B2 and B7, respectively; chloroform at 0.006 mg/kg in B5; methylene chloride at 0.054 mg/kg, 0.007 mg/kg, 0.093 mg/kg, 0.011 mg/kg and 0.011 mg/kg in B2, B4, B5, B9B, and B10, respectively; and toluene at 0.006 mg/kg and 0.014 mg/kg in B2 and B5, respectively (See Table 4). An interpretation of these data are presented in Section 5 of this report.

3.1.2 Total Petroleum Hydrocarbons - Gasoline and Diesel

Total petroleum hydrocarbons (TPH) as gasoline were not found to be present in any of the soil samples submitted for chemical analyses. However, TPH as diesel was detected in nine of the soil samples submitted for analyses (B1, B2, B5, B6, B8, B9B, B11, B13 and B14). TPH concentrations ranged from 10 mg/kg in B14 to 230 mg/kg in B5 (See Table 3). TPH exceeded the site specific leaching potential for TPH (diesel) of 100 mg/kg in B5 and B6 at 230 mg/kg and 180 mg/kg, respectively.

Interpretation of TPH data are further detailed in Section 5.

3.1.3 Metals

All of the fourteen composite soil samples were submitted for metals analyses (EPA Method 6010) in accordance with Title 26 California Code of Regulations (CCR) Section 22-66699 (Title 26). These analyses are referred to as Title 22 analyses by AEL, however, for purposes of reporting, metal analyses will be referred to as Title 26.

Title 26 metals include antimony, arsenic, barium, beryllium, cadmium, chromium (total), cobalt, copper, lead, mercury, molybdenum, nickel, silver, selenium, thallium, vanadium and zinc. Detectable concentrations of the metals arsenic, barium, chromium (total), cobalt, copper, lead, mercury, molybdenum, nickel, vanadium and zinc were present in most of the samples submitted for testing (See Table 5). Neither antimony, beryllium, cadmium, silver, selenium or thallium were present above laboratory detection limits in any of the soil samples submitted for testing.

The highest metal concentrations in soil, particularly lead, were detected in composite samples collected from B3, B4, B5 and B10. Lead was detected at 5,400 mg/kg, 2,500 mg/kg, 2,100 mg/kg and 2,800 mg/kg in composited samples from B3, B4, B5, and B10, respectively (See Table 5). These levels are above the Total Threshold Limit Concentration (TTLC) described in Title 26. Other constituents, such as barium, copper, mercury, nickel and zinc were also detected at relatively high concentrations in soil samples collected from B3, B4, B5 and B10. However, none of the constituents exceeded TTLC limits (See Table 5).

Examination of metal concentrations in composited soil samples to Soluble Threshold Limit Concentration (STLC) limits indicated that barium, copper, mercury, nickel, lead and zinc may exceed STLC limits in several soil samples (See Table 5). To evaluate the concentration of "leachable" metals within the soil, soil samples containing metals significantly over the STLC limits were resubmitted for analytical testing according to the Waste Extraction Test (WET), CCR Title 26. The WET ten-fold dilution method precludes the identification of leachable metals in concentrations of less than 10 times the STLC (Marshack, updated June 1989). On that basis, the soil samples and analytical suites were selected by GRC and SFDPW personnel for re-testing. Results of the WET testing indicate that soluble lead, in most of the samples submitted, exceeded the STLC limit of 5.0 mg/l. Soluble lead was found to range from 3.8 mg/l in the composite soil sample collected from B6 to 160 mg/l in the composite sample collected from B3 (See Table 5).

Comparison of STLC values relative to TTLC revealed anomalously high STLC values, such as 140 mg/l lead compared to 560 mg/kg lead in the composited soil sample from B2. These results suggested to AEL personnel that lithologic variations between samples submitted for compositing may be the cause (Personal Communication, Hampton, AEL, May 23, 1990). For instance, a higher proportion of clays, which may contain higher metal concentrations, may have been present in the composites prepared for the STLC analyses. To evaluate the effect of

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compositing on apparent chemical results, AEL analyzed discrete samples collected from borings B2 and B4 (See Table 6).

Results from discrete sample testing revealed the presence of soluble lead in excess of STLC at 15 mg/l, 64 mg/l and 160 mg/l in samples B2-3.0', B4-3.5' and B4-8.5', respectively. These results are reasonable in light of values of 200 mg/kg, 1,500 mg/kg and 2,500 mg/kg obtained from associated TTLC testing. With the exception of copper in sample B4-8.5', none of the other constituents exceeded STLC limits in B2 and B4 discrete samples. Soluble copper was found to exceed STLC of 25 mg/l in B4-8.5' at 310 mg/l. However, the value of 310 mg/l compared with the associated value of 1,100 mg/kg for TTLC analyses is anomalously high.

Further conversations with AEL personnel regarding anomalous STLC values suggest that variations in metal content within each sample aliquot may account for fluctuating metal content, even in discrete samples (Personal communication, Hampton, AEL, July 9, 1990).

Interpretation of the metals data are further detailed in Section 5 of this report.

3.1.4 PCBs, Cyanides, Sulfides and Semi-Volatile Organics

Neither PCBs, cyanides, sulfides or semi-volatile organics were present above laboratory detection limits in any of the soil samples submitted for these analyses (See Table 3).

3.1.5 pH and Flammability

All of the fourteen soil samples submitted to AEL were analyzed for pH, and 9 of the 14 soil samples were analyzed for flammability. Soil pH ranged from 7.9 in B2 to 9.6 in B7, suggesting relatively alkaline conditions. Flammability was determined to be greater than 140 degrees Fahrenheit in all of the samples analyzed (See Table 3).

3.2 GROUNDWATER SAMPLING RESULTS

Ground water samples were collected from B3 and from an existing well (MW1) at the Unocal station at Phelps Avenue and Evans Street. Analytical results are summarized in Table 7 and 8 and are compared to State Maximum Contaminant Levels (MCLs) and action levels. The usage of MCLs in this report is further discussed in Section 4.0. The original laboratory data are included in Appendix F.

3.2.1 Volatile Organics

Volatile organics, analyzed in accordance with EPA Method 624, were not present above laboratory detection limits in any of the groundwater samples submitted for testing. However, it should be noted that detection limits for various constituents equal or exceed State Maximum Contaminant Levels (MCLs) as presented by the Regional Water Quality Control Board (June, 1989). These constituents include benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane and vinyl chloride (See Table 7).

3.2.2 Total Petroleum Hydrocarbons - Gasoline and Diesel

Total petroleum hydrocarbons (TPH) as gasoline or diesel were not present above laboratory detection limits in any of the groundwater samples submitted for testing (See Table 7).

3.2.3 Metals

Title 26 metal results indicate the presence of arsenic, barium, chromium (total), cobalt, copper, lead, mercury, nickel, vanadium and zinc above laboratory detection limits in the groundwater samples collected from B3 and/or MW1. Antimony, beryllium, cadmium, molybdenum, selenium, silver and thallium were not present above laboratory detection limits in the groundwater samples collected from B3 or MW1.

Copper, lead and mercury were found to exceed State Maximum Contaminant Levels (MCLs) in the groundwater sample collected from B3 (See Table 8). Chromium (total), detected at 0.29 mg/l, exceeds that State MCL of 0.050 mg/l; copper, detected at 1.9 milligram/liter (mg/l), exceeds the State MCL of 1.000 mg/l; lead, detected at 3.3 mg/l, exceeds the State MCL of 0.050 mg/l; and mercury, detected at 0.0024 mg/l, exceeds the State MCL of 0.002 mg/l.

Lead also met or exceeded the State MCL at 0.05 mg/l and 0.09 mg/l (duplicate sample) in MW1 and chromium (total) exceeded that State MCL at 0.09 mg/l (duplicate sample). The remaining metals were either not detected or were below State MCL's. None of the laboratory detection limits exceeded State MCLs (See Table 8).

Interpretation of these analytical data are presented in Section 5 of this report.

3.2.4 Cyanides, Sulfides and Semi-Volatile Organics

Neither cyanides, sulfides or semi-volatile organics were present above laboratory detection limits in the groundwater samples submitted for analyses (See Table 7).

3.2.5 pH and Flammability

The pH of groundwater samples submitted for laboratory analyses was measured at 7.0 for both B3 and MW1 (See Table 7). The pH of groundwater samples monitored in the field were measured between 7.2 and 7.4 at B3 and 6.9 to 7.3 at MW1 (See Appendix C). These data indicate that field measurements are consistent with measurements obtained by the laboratory.

According to the Plan, groundwater samples were to be submitted for Flammability analyses. However, after receiving the groundwater samples, AEL indicated to GRC that the groundwater samples submitted for analyses would not be flammable and suggested that these analyses were not necessary (Personal communication, Hampton, AEL, April 10, 1990).

3.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Laboratory quality assurance/quality control goals were met by submitting a duplicate groundwater sample collected from MW1 (referred to as MW1A) and a field blank (referred to as MW1B), both collected at the staging area of MW1. It should be noted that results from the duplicate groundwater sample collected at MW1 varied from the original sample results within approximately one order of magnitude. Natural variations in groundwater chemistry may be attributed to these variations. None of the chemicals analyzed were detected in the field blank submitted for testing. The pH of the field blank (distilled water) was measured at 6.0.

Laboratory quality assurance testing indicate matrix spike and matrix spike duplicate percentages within acceptable limits (See Appendix E and F).

3.4 GEOLOGY

Regional studies indicate that the Islais Creek Pump Station Project site is underlain by artificial fill and old tidal flat soils (Bonilla, 1971). Previous studies also indicate that the subsurface soils in the areas of Custer and Davidson Avenues consist of 5 to 10 feet of fill underlain by 50 to 60 feet of Bay Mud. Sands (alluvial outwash deposits) and clay (marine deposits, colluvium and slopewash) underlie Bay Mud. Bedrock (Franciscan Formation) was encountered at 100 to 250 feet below ground surface along Custer Avenue (Woodward Clyde, May, 1976).

Subsurface investigations conducted at the site during this investigation confirmed the presence of fill underlain by clay to silty and sandy clay. Interpretations of geologic conditions across the site are presented in cross sections in Figures 3, 4 and 5. Fill consists primarily of grey, brown and red brown sands and gravels, although some clay and silt are also present. Serpentine and/or chert gravels are relatively common in the fill along Custer Avenue (B7 and B8), Davidson Avenue (B9B) and on Phelps Avenue (B12). Brick and concrete fragments, as well as various other debris (wood, glass etc.), are common in the fill. Moisture content and density/stiffness is widely variable in the fill materials.

The clayey materials beneath the fill are interpreted to be natural deposits of Bay Mud. Bay mud is wet to saturated and very soft to soft. Shell fragments, which are characteristic of Bay Mud, are generally present.

3.5 HYDROGEOLOGY

Previous studies in the area of the Islais Creek Pump Station site indicate depth to water at 4 to 6 feet below ground surface, corresponding to elevations of approximately -6 to -8 feet, mean sea level (Woodward Clyde, 1976). Hydrogeologic conditions at the Islais Creek Pump Station site were also evaluated during this investigation from lithologic data (See Appendix A) and water level measurements obtained during drilling and measured in groundwater monitoring wells MW1 and B3 prior to sampling (See Appendes A and D). Groundwater levels are depicted in geologic cross sections presented in Figures 3, 4 and 5.

During drilling, ground water was generally encountered between 6 and 10 feet below ground surface. However, water level measurements recorded at the time of drilling are generally inaccurate due to the presence of soils smeared along the borehole walls. Accurate water level measurements may only be obtained in cased monitoring wells that are developed and allowed

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to reach equilibrium. Thus, water levels measured 5.3 feet and 6.0 feet below ground surface in monitoring wells MW1 and B3, respectively, may be considered representative depths to water at that time (See Appendix D).

The presence of shallow groundwater at the Islais Creek Pump Station site and the tendency for water levels to remain stable following drilling indicate that ground water is unconfined. Water levels are anticipated to respond directly to seasonal and/or tidal fluctuations.

Subsurface geologic conditions indicate that groundwater flow rates may be highest in the sandy, gravelly fill relative to underlying Bay Mud. Thus, potential contaminant migration in ground water would probably occur primarily within the fill materials at the Islais Creek Pump Station site.

4.0 REGULATORY FRAMEWORK

4.1 MAHER ORDINANCE

As described in Section 1.0 of this report, the San Francisco Public Works Code, Article 20 (Maher Ordinance) that states that a "site history for the property be prepared" and that soil sampling and analyses be conducted for "a construction project that involves the disturbance of at least 50 cubic yards of soil and; the parcel of land...is located bayward of the high-tide line as indicated on the Historic San Francisco Maps..." (Article 20, Sections 1001 and 1002).

Section 1002 of the Maher Ordinance also provides a list of analyses which should be conducted on soil samples collected from proposed zones of excavation. Section 1008(e) of the Maher Ordinance states that additional analyses should be conducted to address potential contamination from historical and current site usage. The Maher Ordinance states that if the level of any hazardous waste exceeds quantitative federal or state minimum standards, a Site Mitigation Plan must be prepared and implemented before the Director of Public Works may approve the building permit application (Article 20, Section 1004).

4.2 CALIFORNIA DEPARTMENT OF HEALTH SERVICES

4.2.1 Total Petroleum Hydrocarbons

At present, the DHS has set a TPH concentration of 1,000 mg/kg in soil as a hazardous waste classification criterion. This value was based on ignitability characteristics of gasoline in sandy soil (RWQCB, May, 1988). The DHS is currently researching TPH Concentrations with the objective of re-assessing this threshold value (Personal communication, Mr. Noel Lavery of DHS, April 10, 1990). Analytical results for TPH (gasoline and diesel) indicate that subsurface soils at the Islais Creek Project site should not be considered as a hazardous waste on the basis of diesel content, as per present DHS criteria.

4.2.2 Drinking Water Standards

The DHS provides State action levels and MCLs for various organic and inorganic chemical constituents in drinking water (Tables 7 and 8). MCLs are statutes that may be enforced and State action levels are health advisory guidelines. Action levels and MCLs are water quality goals to protect drinking water resources. Other water quality goals are available to protect marine resources, agriculture and freshwater and aquatic life (RWQCB, updated June, 1989). Although ground water in the Islais Creek Pump Station area is not likely to be used as a potable source of water, comparison between laboratory results and MCLs are presented for reporting purposes. It should be noted that laboratory detection limits for some volatile organics and semi-volatile organics exceed State action levels or MCLs (See Table 7).

4.3 CALIFORNIA CODE OF REGULATIONS - TITLE 26

4.3.1 Total and Soluble Threshold Limit Concentrations

Standards pertaining to chemical concentrations in soil (specifically at landfills) are described in CCR Title 26. These standards cite TTLC values that should not be exceeded in solid form (absorbed in soil). The STLC should not be exceeded in aqueous form (leachable from soil). Wastes that exceed these threshold concentrations are considered hazardous wastes. Threshold concentrations are available for metals, pesticides, PCBs and several volatile and semi-volatile organics. TTLC and STLC limits for metals are provided in Table 5. TTLC and STLC limits for PCBs and volatile and semi-volatile organics outlined in Title 26 are listed in Table 3. Based on historical land usage, pesticides were not suspected, and thus, not tested for at the Islais Creek Pump Station site.

4.3.2 Designated Wastes

In an attempt to provide standards for waste disposal, CCR Title 23, Chapter 3, Subchapter 15 defines "designated waste" as "nonhazardous wastes which consist of, or contain, pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or could cause degradation of waters of the State". Designated wastes are to be discharged to Class II waste management units which have engineered containment features (Marshack, 1989). At present, there are no permitted Class II landfills in California. Further discussion regarding designated wastes are provided below.

4.4 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

4.4.1 Designated Level Methodology and Beneficial Uses

In an attempt to assess the impact of designated wastes on waters of the State, the RWQCB has provided a methodology to derive "designated levels". Designated levels are concentrations of waste constituents which provide a site-specific indication of the waste's water quality impairment potential and are set forth in "Designated Level Methodology for Waste Classification and Cleanup Level Determination" (Marshack, updated 1989).

"Designated Level Methodology" provides a methodology for deriving a specific compound concentration that may pose a threat to water quality. Designated levels are calculated by evaluating beneficial uses of nearby water bodies, identifying existing State or Federal water quality limits that will protect those beneficial uses and by assigning site-specific environmental attenuation factors and leachability factors.

Beneficial uses of ground water is addressed by the San Francisco Bay Basin Water Quality Control Plan as follows: "Present and potential uses applicable to the main ground water basins in the Region are municipal supply, industrial process water supply, industrial service supply and agricultural supply" (December, 1986). This statement implies that the use of MCLs may be appropriate to derive designated levels in the Bay Area as a whole. However, the Basin Plan also states that "Data collected by local agencies and/or dischargers regarding the quality and use of waters in their vicinity represent the best information on beneficial uses". At present, ground water is not being used for drinking water in the general area of Islais Creek. Historic industrial activities and typically brackish water will probably prevent its use as a potable water supply in the future. Consequently, the applicability of drinking water CDG1: 1514-R

standards to ground water in the area of Islais Creek study area may be inappropriate, as well as the applicability the Designated Level Methodology classification system.

The Basin Plan also presents water quality objectives for toxic pollutants for surface waters downstream of Carquinez Strait. Various time-weighted average objectives are provided for arsenic, cadmium, chromium (VI), copper, cyanide, lead, mercury and nickel. In general, the 4-day average objectives are lower than State MCL's and one-hour averages are higher than State MCL's (See Table 9). The applicability of these water quality objectives may be further considered for the Islais Creek Pump Station site during remedial planning phases.

4.4.2 Leaching Potential Analysis

The RWQCB has set forth guidelines to conduct a Leaching Potential Analyses for gasoline and diesel using TPH concentrations. These guidelines are set forth in the Leaking Underground Fuel Tank Field Manual (LUFT, May, 1988). The LUFT Manual provides a scoring method for deriving TPH concentrations that may be left in-place without degrading shallow ground water. Through this scoring method, depth to ground water and other pertinent physical characteristics of the site may be evaluated and a maximum allowable TPH level may be derived. Based primarily on shallow groundwater conditions at the Islais Creek Pump Station site, the allowable TPH (diesel) concentration is determined to be 100 mg/kg (See Figure 6).

4.5 CODE OF FEDERAL REGULATIONS

The Code of Federal Regulations (40 CFR) Part 261, Subpart C, states that a solid waste is classified as a hazardous waste if it exhibits characteristics described in Sections 261.21, 261.22, 261.23 and 261.24 (See 40 CFR, Section 261.20). For purposes of evaluating Islais Creek soil and groundwater chemical results, the following definitions are presented:

Ignitability:	Section 261.21 defines ignitability as "... (having a flash point less than 60 degrees Centigrade (140 degrees Fahrenheit))..."
Corrosivity:	Section 261.22 defines corrosivity as "...aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5..."
Reactivity:	Section 261.23 defines reactivity as "...a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment..."

Although 40 CFR does not provide cyanide and sulfide limits specifically, a document published by the U.S. EPA Office of Solid Waste and Emergency Response provides cyanide and sulfide limits in solid waste as 250 mg/kg and 500 mg/kg, respectively (EPA, 1985).

EP Toxicity:

Section 261.24 defines EP toxicity as "A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Appendix II or equivalent methods approved by the Administrator under the procedures set forth in Sections 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in Table I at a concentration equal to or greater than the respective value given in that Table." EP toxicity limits are equivalent to TTLC and STLC limits set forth in Title 26. The difference between Title 26 (WET) and EP toxicity is the extraction method. The WET extraction method is generally considered to be more aggressive, resulting in conservative chemical results.

As of September 28, 1990, Toxic Characteristic Leaching Potential (TCLP) will be replacing EP Toxicity Procedure (Federal Register, March 29, 1990).

5.0 DATA INTERPRETATION

5.1 VOLATILE ORGANICS

Relatively minor levels of volatile organics were detected in various composite soil samples collected during this investigation (See Tables 3 and 4). None of the volatile organics detected are classified as hazardous under Title 22.

Volatile organics were not detected in groundwater samples above laboratory detection limits. However, it should be noted that laboratory detection limits equal or exceed State MCLs for benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1,2,2-tetrachloroethane and vinyl chloride (See Table 7).

Toluene may be a constituent of either gasoline, diesel or solvents. Acetone and methylene chloride may be constituents of degreasing compounds that may have been used at various locations across the site. The origin of chloroform in the sample collected from B5 is not known.

5.2 TOTAL PETROLEUM HYDROCARBONS - GASOLINE AND DIESEL

Total petroleum hydrocarbons as gasoline were not present in soil above detection limits of 1.0 mg/kg or in ground water above detection limits of 0.05 mg/l. Total petroleum hydrocarbons as diesel are below the DHS waste classification criteria of 1,000 mg/kg but above the site specific leaching potential of 100 mg/kg at B5 (230 mg/kg) and at B6 (180 mg/kg) as listed in Table 3. Diesel was not present in ground water above the laboratory detection limit of 0.05 mg/l. These data indicate that diesel has not leached into the ground water at these locations and that the calculated leaching potential of 100 mg/kg may be too low at the Islais Creek Pump Station site.

5.3 METALS

Metal concentrations were compared with TTLC and STLC values as described in CCR Title 26 Section 66699. With the exception of lead in several samples, none of the metals detected equaled or exceeded TTLC concentrations. Lead exceeded the TTLC concentration of 1,000 mg/kg in composited samples collected at B3 (5,400 mg/kg), B4 (2,500 mg/kg), B5 (2,100 mg/kg) and B10 (2,800 mg/kg). Lead also exceeded TTLC concentrations in discrete samples B4-3.5' and B4-8.5' at 1,500 mg/kg and 2,500 mg/kg, respectively.

As discussed in Section 3.1.3, selected soil samples were submitted for the WET (See Tables 5 and 6). Laboratory data indicate that the STLC (5.0 mg/l) was exceeded for lead in most of the samples submitted for analyses. Soluble lead concentrations ranged from 3.8 mg/l in the composite sample collected from B6 to 160 mg/l in the composite sample collected from B3 and discrete sample B4-8.5'. STLC data indicate that soil in the area of B1, B2, B3, B4, B5, B8, B10 and B13 may be considered hazardous. Additionally, the STLC limit for copper (25 mg/l) is exceeded in sample B4-8.5' at 310 mg/l. STLC for copper is also slightly exceeded in the sample collected from B10 at 27 mg/l.

State drinking water MCLs for chromium (total), copper, lead and mercury were exceeded in the groundwater sample collected from B3 and in the duplicate sample collected from MW1 (See Table 8). As discussed in Section 4, the unsuitable quality of ground water in the Islais Creek Pump Station area for drinking water purposes may render comparisons with MCLs as inappropriate.

A particular area of concern in regard to soil and groundwater contamination is the AC Auto Wrecker facility. Chemical findings in relation to boring locations are depicted in Figure 7.

In general, metals precipitate in alkaline environments. Figure 8 indicates ranges of pH where precipitation is known to occur. Comparison of metal analytical results and pH of soil and ground water suggest that relatively alkaline conditions exist at the Islais Creek site. Thus, naturally occurring alkaline conditions have, at least partially, immobilized metals within the soil system. The presence of metals in ground water suggests that metals may be present in concentrations that exceed the tendency to sorb onto soil particles.

It should be noted that most of the laboratory results represent samples collected from composited soil samples. Based on a depth to water ranging between 4 and 6 feet below ground surface, it is probable that composited samples were collected from both the unsaturated and saturated zones in each borehole. Therefore, it is not certain whether metal concentrations reflect "source" concentrations or whether metals were "imported" by ground water. However, the tendency for metals to remain sorbed onto soil particles suggests that the source of metal contamination is near of the boreholes where the samples were collected.

Specific metal sources at the Islais Creek site are not currently known. Contamination may have been introduced during fill placement. Numerous industrial activities could have contributed metals to the environment. Long-term storage and subsequent dissolution of metal parts at many of the locations across the site is suspected.

5.4 PCBS, CYANIDES AND SULFIDES AND SEMI-VOLATILE ORGANICS

PCBs, cyanides or sulfides were not present above laboratory detection limits in either soil or ground water and thus, do not exceed limits set forth by the CCR (Title 26), U.S. EPA (Office of Solid Waste) or by DHS (State MCLs).

Semi-volatile organics were not present above laboratory detection limits and thus, do not exceed limits set forth in CCR (Title 26) or DHS (State MCLs or action levels). However, it should be noted that some laboratory detection limits exceed State MCLs (See Table 7).

5.5 PH AND FLAMMABILITY

Relatively high pH of the soils, up to 9.6 in the sample collected from B7, may be attributable to the presence of calcium carbonate contained within the shells characteristic of the Bay Mud deposits, or by the possible industrial use of sodium or calcium hydroxides in the Islais Creek Pump Station area. Although pH values of soil are relatively high, they do not exceed the value of 12.5 defined as "corrosive" by 40 CFR.

Flammability results indicating flash points of greater than 140 degrees Fahrenheit indicate that soils in the Islais Creek Pump Station area are not flammable as defined by 40 CFR.

6.0 CONCLUSIONS

The SFCWP, under the auspices of the SFDPW, retained Geo/Resource Consultants, Inc. to conduct a "Site History Review" (December 18, 1989) of potential contaminant sources in the vicinity of the proposed Islais Creek Pump Station site. Based on findings presented in the Site History Review and Maher Ordinance requirements, GRC submitted a Sampling and Testing Plan (Plan) to the SFDPW in January of 1990. The Plan presented recommendations and proposed methodologies for implementing a drilling and laboratory investigative program for Islais Creek Pump Station site. The SFDPW provided GRC with comments on the Plan and a revised Sampling and Testing Plan was implemented in March, 1990.

Based on boring locations relative to proposed pump station excavations, GRC suggests that, in accordance with San Francisco Department of Public Works requirements (November, 19, 1986), the soils analyses presented herein are likely to be representative of shallow soil conditions encountered during excavation at each sampling location.

The data obtained during this investigation indicate that levels of metals, particularly lead, are above TTLC/STLC limits at some locations. Two areas of "elevated" metal concentrations exist at the Islais Creek site: 1) the AC Auto Wreckers site, and 2) the Phelps Avenue area, in proximity to B10. Additionally, diesel concentrations in the area of B5 (AC Auto Wreckers) and B6 (near Circosta) are elevated. Although concentrations are below the "hazardous level" of 1,000 mg/kg, they are above the site specific leaching potential level to protect drinking water (100 mg/kg).

Analytical results for soil indicate metal concentrations that may adversely impact groundwater quality and possibly, human health, through air and/or dermal pathways. In particular, chromium (total), copper and lead concentrations detected in ground water at B3 (AC Auto Wreckers), suggest that high metal concentrations in soil may have impacted ground water in that area.

The list below provides a summary of boring sites where contaminants exceed or equal regulatory statutes and/or guidelines:

B1 - Davidson Avenue

Soil Composite		
Soluble Lead	= 26 mg/l	STLC (5.0 mg/l)

B2 - A.C. Auto Wrecker

Soil Composite		
Soluble Lead	= 140 mg/l	STLC (5.0 mg/l)

B2-3.0'		
Soluble Lead	= 15 mg/l	STLC (5.0 mg/l)

B3 - A.C. Auto Wrecker

Soil Composite

Lead	= 5,400 mg/kg	TTLc (1,000 mg/kg)
Soluble Lead	= 160 mg/l	STLC (5.0 mg/l)

Groundwater Sample

Copper	= 1.4 mg/l	State MCL = 1.000 mg/l
Lead	= 3.3 mg/l	State MCL = .050 mg/l
Mercury	= 0.0024 mg/l	State MCL = 0.002 mg/l
Total Chromium	= 0.29 mg/l	State MCL = 0.050 mg/l

B4 - A.C. Auto Wrecker

Soil Composite

Lead	= 2,500 mg/kg	TTLc (1,000 mg/kg)
Soluble Lead	= 16 mg/l	STLC (5.0 mg/l)

B4-3.5'

Lead	= 1,500 mg/kg	TTLc (1,000 mg/kg)
Soluble Lead	= 64 mg/l	STLC (5.0 mg/l)

B4-8.5'

Lead	= 2,500 mg/kg	TTLc (1,000 mg/kg)
Soluble Lead	= 160 mg/l	STLC (5.0 mg/l)
Soluble Copper	= 310 mg/l	STLC (25 mg/l)

B5 - A.C. Auto Wrecker

Soil Composite

Lead	= 2,100 mg/kg	TTLc (1,000 mg/kg)
Soluble Lead	= 130 mg/l	STLC (5.0 mg/l)
TPH - Diesel	= 230 mg/kg	Leaching Potential (100 mg/kg)

B6 - Rankin Street near Circosta

Soil Composite

TPH - Diesel	= 180 mg/kg	Leaching Potential (100 mg/kg)
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B8 - Custer Avenue/Third Street

Soil Composite

Soluble Lead	= 5.1 mg/l	STLC (5.0 mg/l)
--------------	------------	-----------------

B10 - Davidson Avenue/Phelps Street

Soil Composite

Lead	= 2,800 and 1,500 mg/kg	TTL (1,000 mg/kg)
------	----------------------------	-------------------

Soluble Lead	= 46 mg/l	STLC (5.0 mg/l)
--------------	-----------	-----------------

Soluble Copper	= 27 mg/l	STLC (25 mg/l)
----------------	-----------	----------------

B13 - Southeast Water Pollution Control Plant

Soil Composite

Soluble Lead	= 11 mg/l	STLC (5.0 mg/l)
--------------	-----------	-----------------

MW1 - Monitoring Well at Unocal 76 Station, Phelps Street

Groundwater Sample

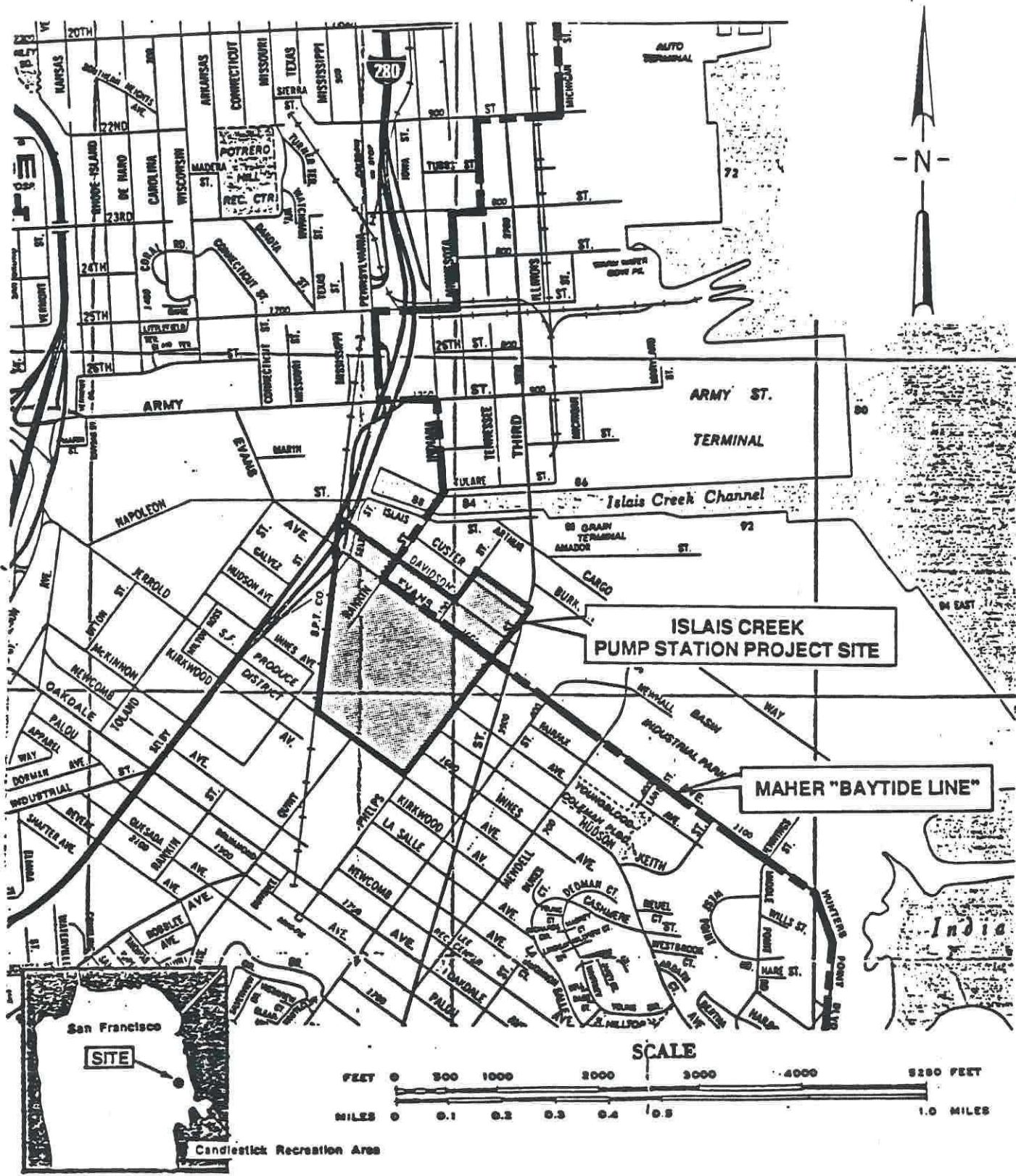
Lead	= 0.09 mg/l & 0.05 mg/l	State MCL = 0.050 mg/l
------	----------------------------	------------------------

Total Chromium	= 0.42 mg/l & 0.09 mg/l	State MCL = 0.050 mg/l
----------------	----------------------------	------------------------

7.0 REFERENCES

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FIGURES



Adapted from: California State Automobile Assoc., 1988
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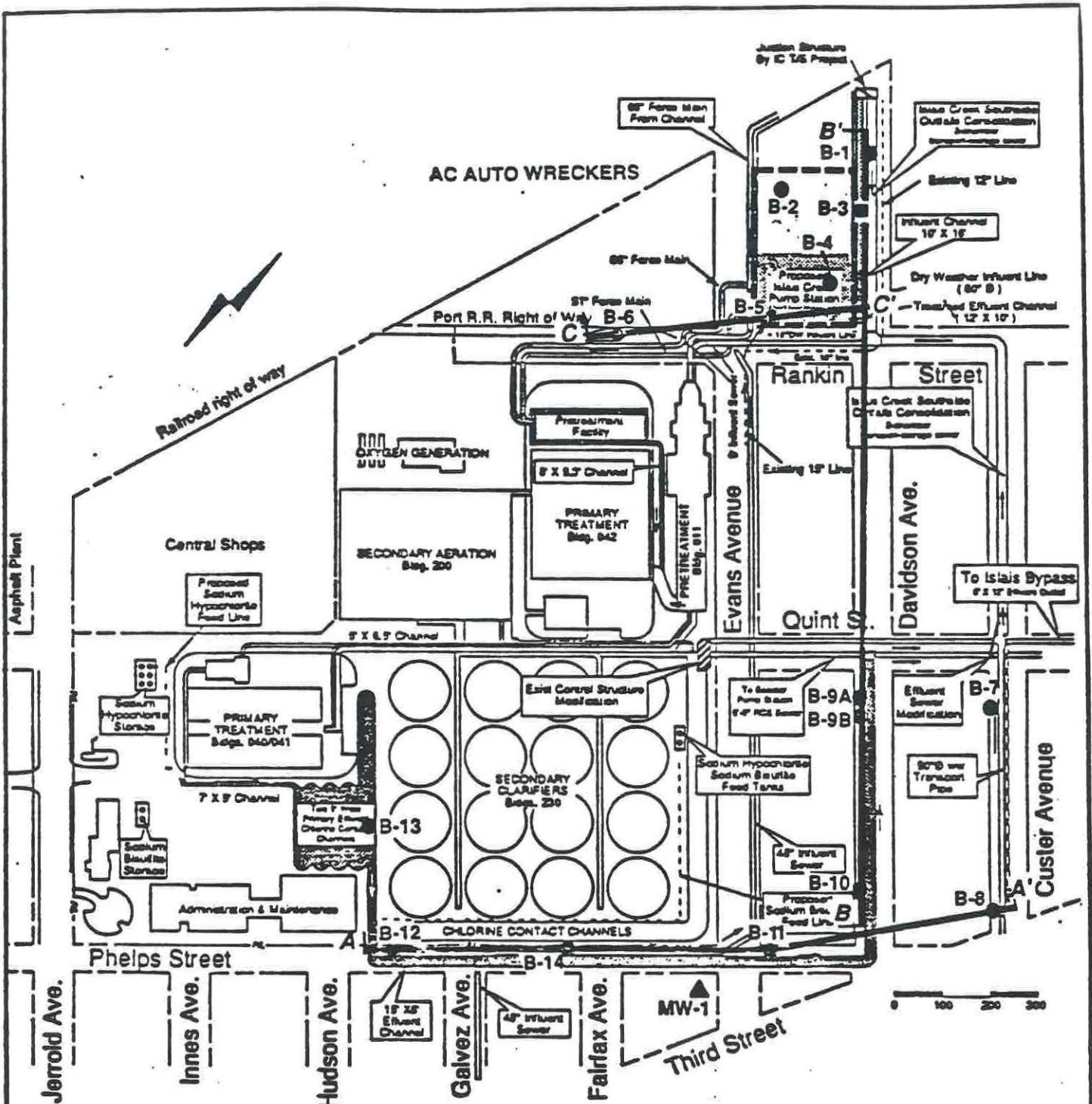
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GENERAL VICINITY MAP
ISLAIS CREEK PUMP STATION PROJECT
SOUTHEAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

1

Job No. 1514-00-02 Appr. ADT Date 6/19/90



REFERENCE : San Francisco Dept. of Public Works Clean Water Program, 1989

EXPLANATION

B-2 ● Borings B-1 through B-14 Drilled by GRC - March, 1990

B-3 ■ Monitoring Well installed by GRC - March, 1990

MW-1▲ Monitoring Well installed by Applied Geosystems - 1985-1986

A—A' Geologic Cross-Section

- Existing Facilities
- Proposed SEWPCP Facilities
- Proposed ICPS Facilities
- Proposed WW Transport Pipe



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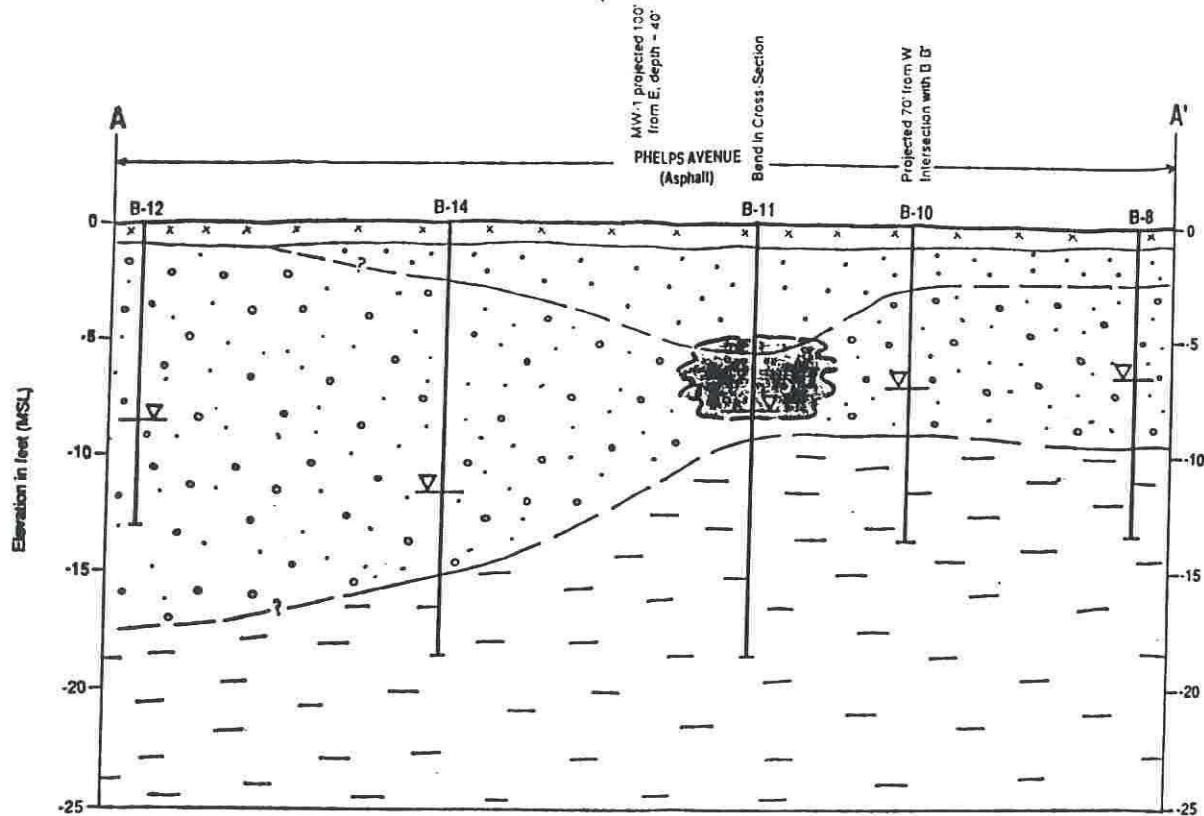
Job No. 1514-00-02 Appr. *ADT* Date 7/18/90

SITE MAP
(SHOWING BORING LOCATIONS)
ISLAIS CREEK PUMP STATION PROJECT
SOUTHEAST WATER POLLUTION
CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

2

CROSS-SECTION A-A'



LEGEND

- x x Base rock, sandy gravel
- . . . Artificial Fill - Red brown sands, gravel
- o o o Artificial Fill - Grey, brown sands, gravels with silt and clay
- — — Bay Mud - Grey, olive silty, sandy clay with shells
- Known extent of TPH - Diesel over 10 mg/kg.
- ▽ Water Table - approximate, at time of drilling

Approx. Horizontal scale:
1" = 150'
Vertical Exaggeration: 30X
(Elevations estimated from
Woodward Clyde, 1976.)

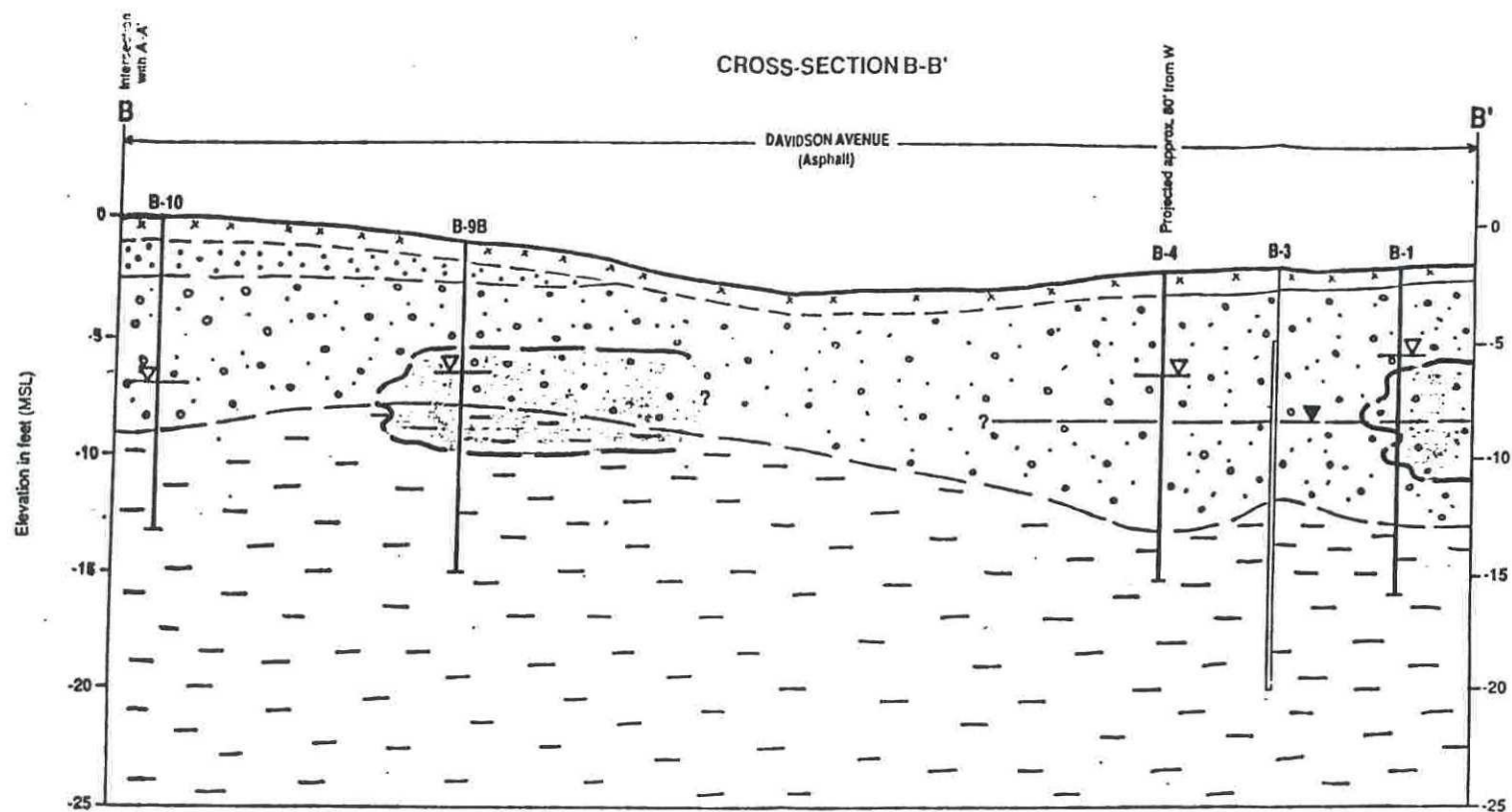


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Job No. 1514-00-02 Appr. *GIN* Date 4/26/90

GEOLOGIC CROSS-SECTION A-A'
Islands Creek Pump Station Project
Southeast Water Pollution Control Plant
San Francisco, California

FIGURE
3



LEGEND

- Base rock, sandy gravel
- Artificial Fill - Red to yellow brown gravel, sand, clay, silt
- Artificial Fill - Grey, brown, black sands, gravels with silt and clay
- Bay Mud - Grey, silty clay with shells
- Known extent of TPH - Diesel over 10 mg/kg
- Water Table (based on water level measured at B-3 on March 26, 1990)

Water Table - approximate, at time of drilling

Approx. Horizontal scale:
1" = 150'
Vertical Exaggeration: 30X
(Elevations estimated from
Woodward Clyde, 1976.)



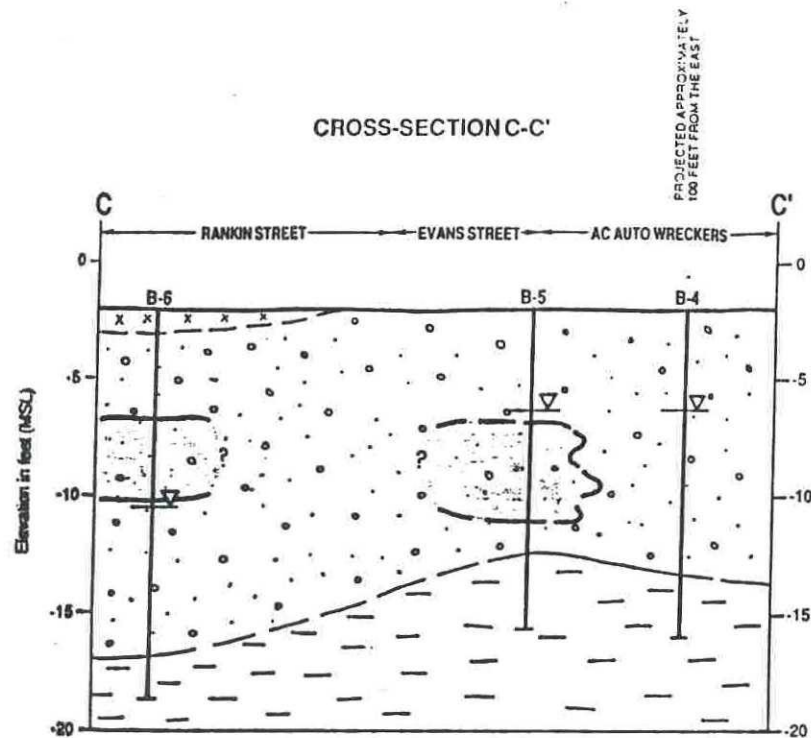
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Job No. 1514-00-02 Appr. *APT* Date 4/26/90






GEOLOGIC CROSS-SECTION B-B'
Islais Creek Pump Station Project
Southeast Water Pollution Control Plant
San Francisco, California

FIGURE
4

CROSS-SECTION C-C'



LEGEND

-  Base rock, sandy gravel
-  Artificial Fill - Grey, brown, red brown sands, gravels with silt and clay
-  Bay Mud - Grey clay with shells
-  Known extent of TPH - Diesel over 10 mg/kg
-  Water Table - approximate, at time of drilling

Approx. Horizontal scale:
1" = 100'

Vertical Exaggeration: 20X
(Elevations estimated from
Woodward Clyde, 1976.)



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Job No. 1514-00-0 Appr. 2/27/90 Date 4/26/90

GEOLOGIC CROSS-SECTION C-C'
Isais Creek Pump Station Project
Southeast Water Pollution Control Plant
San Francisco, California

FIGURE

5

SITE FEATURE	S C O R E	SCORE 10 PTS IF CON- DITION IS MET	S C O R E	SCORE 9 PTS IF CON- DITION IS MET	S C O R E	SCORE 5 PTS IF CON- DITION IS MET
Minimum Depth to Ground Water from the Soil Sample (feet)		>100		51-100	0	25-50\1
Fractures in subsurface (applies to foothills or mountain areas)	10	None		Unknown		Present
Average Annual Precipitation (inches)		<10	9	10-25		26-40\2
Man-made conduits which increase vertical migration of leachate		None	9	Unknown		Present
Unique site features: recharge area, coarse soil, nearby wells, etc	10	None		At least one		More than one
COLUMN TOTALS-TOTAL PTS	20	+	18	+	0	= 38
RANGE OF TOTAL POINTS	49pts or more		41 - 48 pts		40pts or less	
MAXIMUM ALLOWABLE B/T/X/E LEVELS (PPM)	1/50/50/50		.3/.3/1/1		NA\3	
MAXIMUM ALLOWABLE TPH LEVELS (PPM)	GASOLINE	1000	100		10	
	DIESEL	10000	1000		100	

- \1 If depth is greater than 5 ft. and less than 25 ft., score 0 points.
 If depth is 5 ft. or less, this table should not be used.
 \2 If precipitation is over 40 inches, score 0 points.
 \3 Levels for BTX&E are not applicable at a TPH concentration of 10ppm (gasoline) or 100ppm (diesel) (For explanation see step 6, page 27.)

Reference : RWQCB, October 1989



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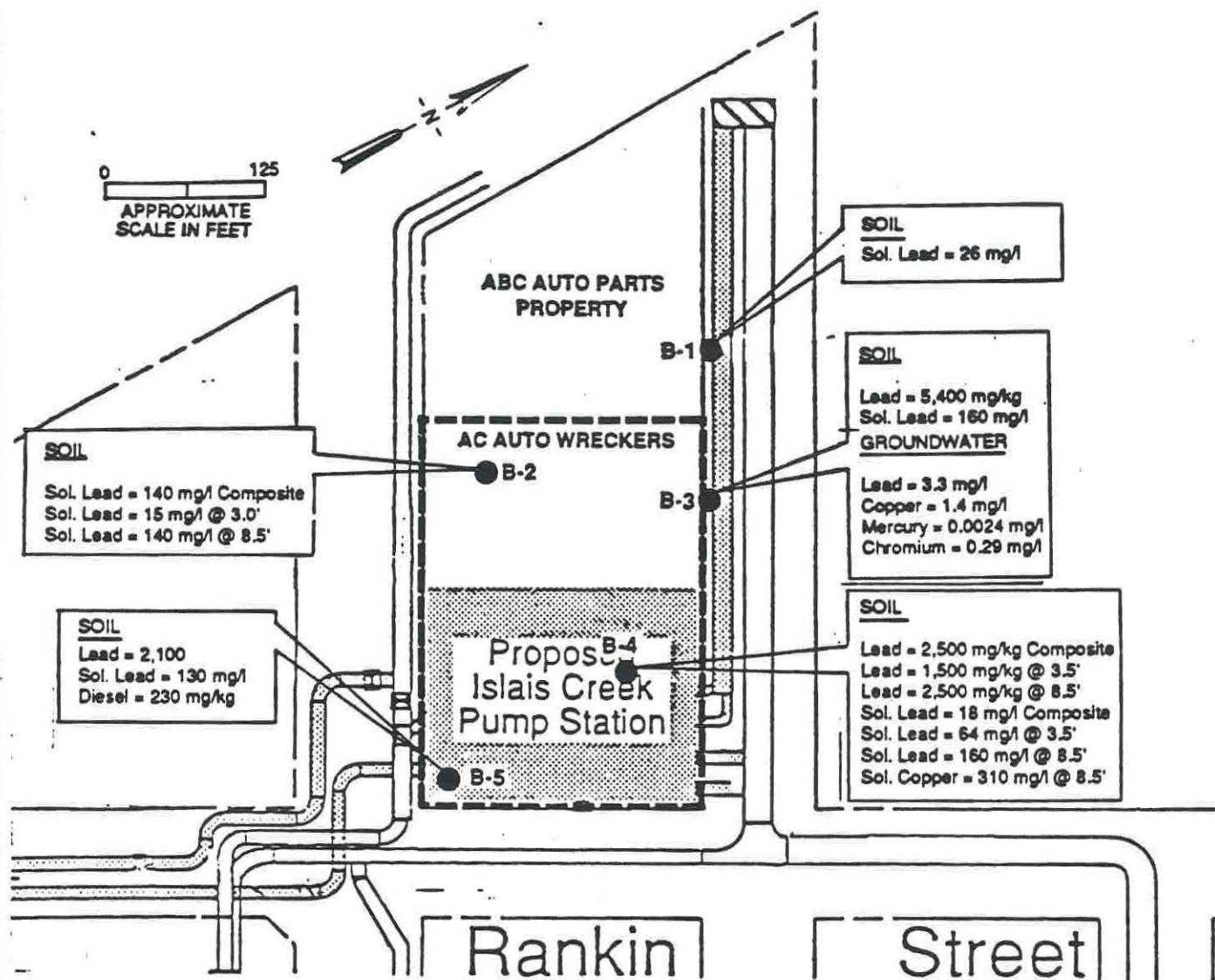
Job No. 1514-00-02 Appr. ADT Date 6/19/90

DATAPRINT N45837

LEACHING POTENTIAL ANALYSIS
 FOR GASOLINE AND DIESEL
 ISLAIS CREEK PUMP STATION PROJECT
 SOUTHEAST WATER POLLUTION CONTROL PLANT
 SAN FRANCISCO, CALIFORNIA

FIGURE

6



EXPLANATION

B-2 ● Boring Location

Proposed ICPS Facilities

REFERENCE: Adapted from San Francisco Dept. of Public Works
Clean Water Program, 1989



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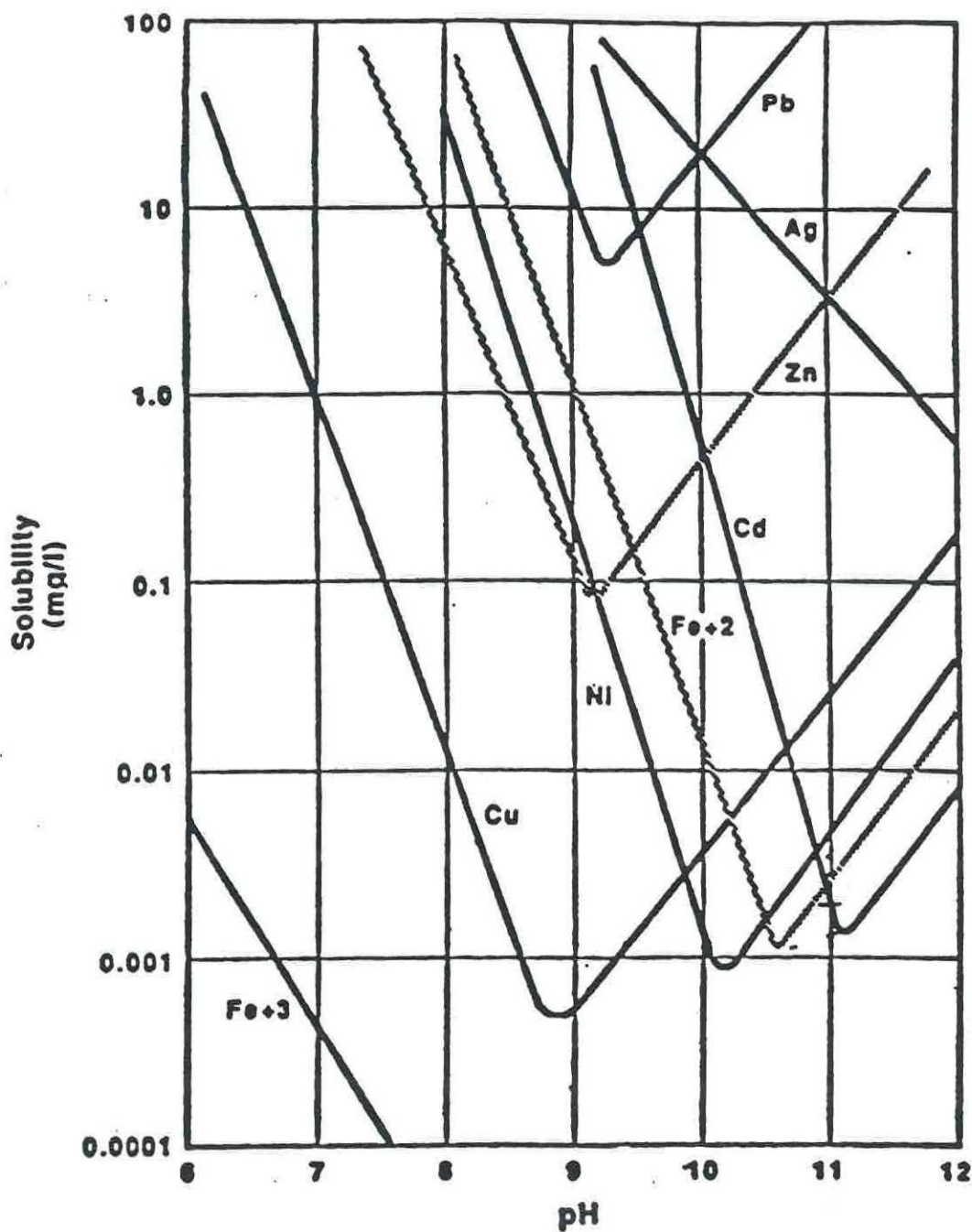
Job No. 1514-00-02 Appr. *ADT* Date 6/19/90

DATAPRINT N45837

BORING LOCATIONS
AC AUTO WRECKERS AND ABC AUTO PARTS
SHOWING FINDINGS ABOVE TTLC/STLC AND MCLs
ISLAIS CREEK PUMP STATION PROJECT
SOUTHEAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

7



Reference: Federal Register (40 CFR Part 268), August 12, 1987.



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Job No. 1514-00-2 Appr. ADT Date 5/17/90

DATAPRINT M45837

**SOLUBILITIES OF METAL HYDROXIDES
AS A FUNCTION OF pH**
ISLAIS CREEK PUMP STATION
SOUTHEAST WATER POLLUTION PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

8

TABLES

TABLE 1
ISLAIS CREEK PUMP STATION
BORING LOCATION RATIONALE

<u>BORING</u>	<u>LOCATION</u>	<u>PRIMARY SUSPECTED CONTAMINANTS</u>
B1	Within zone of proposed excavation, in proximity to ABC Auto Parts.	Fuels, solvents, metals
B2	Within zone of proposed excavation, within AC Auto Wreckers property boundary.	Fuels, solvents, metals
B3	Within zone of proposed excavation, in proximity to AC Auto Wreckers.	Fuels, solvents, metals
B4	Within zone of proposed excavation, within AC Auto Wreckers property boundary.	Fuels, solvents, metals
B5	Within zone of proposed excavation, within AC Auto Wreckers property boundary.	Fuels, solvents, metals
B6	Within zone of proposed excavation, in proximity to Circosta Iron and Metal Company.	Metals, solvents, fuels
B7	Within general zone of proposed excavation, in proximity to the former McKesson Chemical Warehouse.	Unknown
B8	Within general zone of proposed excavation, in proximity to Peters Transportation Company.	Fuels, solvents
B9	Within general zone of proposed excavation, in proximity to the former McKesson Chemical Warehouse.	Unknown
B10	Within general zone of proposed excavation, in proximity to XTRA Oil Company/Shell Service Station.	Fuel, solvents
B11	Within general zone of proposed excavation, in proximity to XTRA Oil Company/Shell Service Station.	Fuel, solvents
B12	Within general zone of proposed excavation, in proximity to Refrigerator Storage facility (formerly Keystone Batteries, Inc.).	Fuels, solvents, metals
B13	Within zone of proposed excavation, within SWPCP property boundary.	Unknown
B14	Within zone of proposed excavation, in proximity to a previous foundry and an oil storage yard/gasoline station.	Metals, fuel, solvents

Note: Information obtained from Figure 4, "Site History Review," GRC, December 1989.

CDG1: 1514-T1

Geo/Resource Consultants, Inc.

TABLE 2
ISLAIS CREEK PUMP STATION
ANALYTICAL TESTING PARAMETERS AND LOCATIONS

SOIL PARAMETERS	EPA METHOD	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	MW1	MW1A	MW1B
Title 26 Metals	6010	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
PCBs (Only)	8080	X	X	X		X	X						X	X	X			
pH	9040	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Flammability	1010				X			X	X	X	X	X	X	X	X			
Cyanides	9010				X			X	X	X	X	X	X	X	X			
Sulfides	9030				X			X	X	X	X	X	X	X	X			
Volatile Organics-GCMS	8240				X	X		X	X	X	X	X						
Semi-Volatile Organics-GCMS	8270				X			X	X	X	X	X						
Aromatic Volatile Organics	8020	X		X			X						X	X	X			
Semi-Volatile Organics	8010	X		X			X						X	X	X			
TPH-Diesel	8015	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
TPH-Gasoline	8015	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
GROUND WATER	EPA METHOD	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	MW1	MW1A	MW1B
Title 22 Metals	6010			X												X	X	X
pH	9045			X												X	X	X
Cyanides	9010			X												X	X	X
Sulfides	9030			X												X	X	X
Volatile Organics-GCMS	624			X												X	X	X
Semi-Volatile Organics-GCMS	625			X												X	X	X
TPH-Diesel	8015			X												X	X	X
TPH-Gasoline	8015			X												X	X	X

**TABLE 3
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS**

	EPA METHOD	B1 (1.2, 2.2' Composite)	B2 (3.2, 4.2' Composite)	B3 (4.2, 7.2' Composite)	B4 (2.2, 4.2' Composite)	B5 (4.2, 6.2' Composite)	B6 (1.2, 3.2' Composite)	B7 (3.2, 6.2' Composite)	Laboratory Detection Limit
Trace 22 Metals	6010	See Table 5 for all samples analyzed							
PCBs (mg/kg)	8080	ND	ND	ND	-	ND	ND	-	0.5-1 mg/kg
pH	9040	8.8	7.9	8.6	8.0	8.2	8.8	9.6	0.1
Flammability	1010	-	-	-	>140 F	-	-	>140 F	60-140 F degrees
Cyanides (mg/kg)	9010	-	-	-	ND	-	-	ND	0.1 mg/kg
Sulfides (mg/kg)	9030	-	-	-	ND	-	-	ND	0.1 mg/kg
Volatile Organics **	8240	See Table 4 for all samples analyzed.							
Semivolatile Organics (mg/kg)	8270	-	-	-	ND	-	-	ND	1-5 mg/kg
Aromatic Volatile Organics (mg/kg)	8020	ND	-	ND	-	-	ND	-	0.010-0.020 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	ND	-	ND	-	-	ND	-	0.010-0.020 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	ND	ND	ND	ND	ND	ND	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	52	63	ND	ND	230	180	ND	10 mg/kg
HnU (mg/kg) ***		ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	300, 245 200, 160	1 mg/kg

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 4.0)

	<u>TTLC</u>	<u>STLC</u>	<u>EPA office of Solid Waste and Emergency Response</u>	<u>DHS Hazardous Waste Criteria for TPH</u>	<u>RWQCB Site Specific Leaching Potential for TPH</u>
PCBs	5 mg/kg	0.5 mg/l	cyanide: 250 mg/kg	1,000 mg/kg	100 mg/kg
Pentachlorophenol	17 mg/kg		sulfide: 500 mg/kg		
Trichloroethylene	2,040 mg/kg				

Notes:

* Sample B9B also referred to as sample B9 in original laboratory data

** Chemical constituents under EPA 8240 are ND for all samples with exceptions listed on Table 4

*** HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs in Appendix A for depth of measurements

(-) Dash = not tested

ND = Not Detected at or above indicated detection limit.

Original laboratory data supplied by AEL, Appendix E

TABLE 3 (Continued)
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS

	EPA METHOD	B8 (4.5', 7.5' Composite)	B9B* (4.5', 9.5' Composite)	B10 (4.5', 8.5' Composite)	B11 (4.5', 8.5' Composite)	B12 (4.5', 8.5' Composite)	B13 (4.5', 8.5' Composite)	B14 (4.5', 8.5' Composite)	Laboratory Detection Limit
Total 22 Metals	6010	See Table 5 for all samples analyzed							
PCBs (mg/kg)	8080	-	-	-	-	ND	ND	ND	0.5-1mg/kg
pH	9040	8.8	9.2	8.4	8.6	8.4	8.7	9.0	8.1
Flammability	1010	>140 F	>140 F	>140 F	>140 F	>140 F	>140 F	>140 F	60-140 F
Cyanides (mg/kg)	9010	ND	ND	ND	ND	ND	ND	ND	0.1 mg/kg
Sulfides (mg/kg)	9030	ND	ND	ND	ND	ND	ND	ND	0.1 mg/kg
Volatile Organics **	8240	See Table 4 for all samples analyzed							
Semivolatile Organics (mg/kg)	8270	ND	ND	ND	ND	-	-	-	1-5 mg/kg
Aromatic Volatile Organics (mg/kg)	8020	-	-	-	-	ND	ND	Toluene - 0.039	0.010-0.020 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	-	-	-	-	ND	ND	ND	0.010-0.020 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	ND	ND	ND	ND	ND	ND	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	16	70	ND	11	ND	18	10	10 mg/kg
HnU (mg/kg)		84, 125, 110	2, 2	1.2, ND	430, 48, 4	190, 40, 230	ND, ND, ND	2, 4, 10, 19	1 mg/kg

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 4.0)

	TTLIC	STLC	EPA office of Solid Waste and Emergency Response	DHS Hazardous Waste Criteria for TPH	RWQCB Site Specific Leaching Potential for TPH
PCBs	5 mg/kg	0.5 mg/l	cyanide: 250 mg/kg	1,000 mg/kg	100 mg/kg
Pentachlorophenol	17 mg/kg		sulfide: 300 mg/kg		
Trichloroethylene	2,040 mg/kg				

Notes:

* Sample B9B also referred to as sample B9 in original laboratory data

** Chemical constituents under EPA 8240 are ND for all samples with exceptions listed on Table 4

*** HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs in Appendix A for depth of measurements

(-) Dash = not tested

ND = Not Detected at or above indicated detection limit.

Original laboratory data supplied by AEL, Appendix E

TABLE 4
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS FOR VOLATILE ORGANICS EPA METHOD 8240

	B2 3.0', 8.5' Composite (mg/kg)	B4 3.5', 8.5' Composite (mg/kg)	B5 4.5', 8.5' Composite (mg/kg)	B7 3.0', 8.5' Composite (mg/kg)	B8 4.5', 7.5' Composite (mg/kg)	B9B 4.5', 9.0' Composite (mg/kg)	B10 4.5', 8.5' Composite (mg/kg)	B11 4.5', 8.0' Composite (mg/kg)	Laboratory Detection Limit (mg/kg)
Acetone	0.120	ND	ND	0.110	ND	ND	ND	ND	0.1
Chloroform	ND	ND	0.006	ND	ND	ND	ND	ND	0.005
Methylene Chloride	0.054	0.007	0.093	ND	ND	0.011	0.011	ND	0.005
Toluene	0.006	ND	0.014	ND	ND	ND	ND	ND	0.005

Notes: Original laboratory data supplied by AEL, Appendix E
 ND = Not detected at or above indicated Detection Limit

TABLE 5
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS FOR COMPOSITED SOIL SAMPLES
TITLE 26 METALS (TTLC and STLC)

	B1 4.2', 8.8' Composite mg/kg (mg/l)	B2* 3.0', 8.5' Composite mg/kg (mg/l)	B3 4.5', 7.5' Composite mg/kg (mg/l)	B4* 3.5', 8.5' Composite mg/kg (mg/l)	B5 4.5', 8.5' Composite mg/kg (mg/l)	B6 4.5', 8.8' Composite mg/kg (mg/l)	B7 3.0', 8.5' Composite mg/kg (mg/l)	Laboratory Detection Limit mg/kg (mg/l)	TTLC mg/kg	STLC (mg/l)
Antimony	ND	ND	ND	ND	ND	ND	ND	25	500	15
Arsenic	0.65	6.9	1.5	8.2	7.2	1.1	1.2	0.50	500	5.0
Barium	80	110	2700 (12)	680	510	110	34	5.00 (0.05)	10000	100
Beryllium	ND	ND	ND	ND	ND	ND	ND	1.00	75	0.75
Cadmium	ND	ND	ND	ND	ND	ND	ND	1.00	100	1.0
Chromium (Total)	35	ND	410	85	120	58	59	5.00	2500	560
Cobalt	5.2	ND	26	9.1	22	12	11	5.00	8000	80
Copper	78	6.9	730 (18)	840 (ND)	280 (10)	190	27	5.00 (0.05)	2500	25
Lead	830 (26)	530 (160)	3400 (160)	2500 (18)	2100 (130)	100 (3.8)	24	5.00 (0.05)	1000	5.0
Mercury	0.24	0.66	0.42	0.87	0.84	0.23	0.09	0.05	20	0.2
Molybdenum	5.0	8.3	ND	10	ND	14	20	5.00	3500	350
Nickel	26	21	640 (6.6)	120	470 (2.8)	140	45	5.00 (0.05)	2000	20
Selenium	ND	ND	ND	ND	ND	ND	ND	0.50	100	1.0
Silver	ND	ND	ND	ND	ND	ND	ND	5.00	500	5
Thallium	ND	ND	ND	ND	ND	ND	ND	10.00	700	7.0
Vanadium	29	13	20	20	19	42	43	5.00	2400	24
Zinc	240	490	2400 (66)	1500 (ND)	1300 (72)	110	67	5.00 (0.05)	5000	250

Note: ND = Not Detected at or above indicated detection limit
STLC values indicated in parentheses ()

* See Table 6 for TTLC and STLC results for discrete samples

Boled values exceed TTLC or STLC

CDG1: 1514-T5.1

Original laboratory data supplied in Appendix B

TABLE 5 (Continued)
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS FOR COMPOSITED SOIL SAMPLES
TITLE 26 METALS (TTLC and STLC)

	B8 4.5', 7.5' Composite mg/kg (mg/l)	B9 4.5', 9.0' Composite mg/kg (mg/l)	B10 4.5', 8.5' Composite mg/kg (mg/l)	B11 4.5', 8.0' Composite mg/kg (mg/l)	B12 4.5', 8.5' Composite mg/kg (mg/l)	B13 4.0', 8.5' Composite mg/kg (mg/l)	B14 4.5', 8.5' Composite mg/kg (mg/l)	Laboratory Detection Limit mg/kg (mg/l)	TTLC mg/kg	STLC mg/l
Antimony	ND	ND	ND	ND	ND	ND	ND	25	500	15
Arsenic	1.2	ND	1.9	1.4	ND	ND	ND	0.50	800	5.0
Barium	250	100	820	110	63	110	28	5.00	10000	100
Beryllium	ND	ND	ND	ND	ND	ND	ND	1.00	75	0.75
Cadmium	ND	ND	ND	ND	ND	ND	ND	1.00	100	1.0
Chromium (Total)	38	200	43	86	340	75	46	5.00	2500	560
Cobalt	16	23	16	14	43	22	5.5	5.00	8000	80
Copper	70/85 (3.8)	18	330/240 (27)	22	14	120	7.5	5.00 (0.05)	2500	25
Lead	120/65 (5.1)	10	2800/1500 (46)	ND	14	110/170 (11)	5.5	5.00 (0.05)	1000	5.0
Mercury	2.4/1.3 (0.0022)	0.51	0.44	0.68	0.15	0.66	0.29	0.05 (0.005)	20	0.2
Molybdenum	14	7.7	21	6.6	ND	30	6.7	5.00	3500	350
Nickel	38	180	36	93	110	61	27	5.00	2000	20.0
Selenium	ND	ND	ND	ND	ND	ND	ND	0.50	100	1.0
Silver	ND	ND	ND	ND	ND	ND	ND	5.00	500	5
Thallium	ND	ND	ND	ND	ND	ND	ND	10.00	700	7.0
Vanadium	32	45	34	22	40	80	30	5.00	2400	24
Zinc	120	48	820	40	52	150	29	5.00	5000	250

Note: ND = Not Detected at or above Indicated detection limit
 STLC values indicated in parentheses ()
 Second metal results obtained from recomposited duplicate samples used to derive some STLC Values
 See Table 6 for TTLC and STLC results for discrete samples
 Bolded values exceed TTLC or STLC
 Original laboratory data supplied in Appendix E

TABLE 6
ISLAIS CREEK PUMP STATION
SOIL ANALYTICAL RESULTS FOR DISCRETE SAMPLES
TITLE 26 METALS (TTLC AND STLC)

	B2 (3.0') mg/kg (mg/l)	B2 (8.5') mg/kg (mg/l)	B4 (3.5') mg/kg (mg/l)	B4 (8.5') mg/kg (mg/l)	Laboratory Detection Limit mg/kg (mg/l)	TTLC mg/kg	STLC mg/l
Copper	9.5 (0.53)	130 (4.9)	50 (3.1)	1100 (310)	5 (0.05)	2500	25
Lead	200 (15)	140 (1.8)	1500 (64)	2500 (160)	5 (0.05)	1000	5
Zinc	58 (3.2)	320 (6.2)	220 (12)	2300 (80)	5 (0.05)	5000	250

Notes: STLC values indicated in parentheses ()
 Bolded values exceed TTLC or STLC
 Original laboratory data supplied by AEL, Appendix F

TABLE 7
ISLAIS CREEK PUMP STATION
GROUND WATER ANALYTICAL RESULTS

	EPA METHOD	B3	MW1	MW1A (MW1 Duplicate)	MW1B (Field Blank)	Laboratory Detection Limit (mg/l)	State MCLs and/or Action Levels
Title 22 Metals (mg/l)	6010/7000	See Table 8 for all samples					
pH	150.1	7.0	7.0	7.0	6.0	0.1	Not Listed
Cyanides (mg/l)	335	ND	ND	ND	ND	0.1	0.200* mg/l
Sulfides (mg/l)	376	ND	ND	ND	ND	0.1	Not listed
Volatile Organics (mg/l)	624	ND	ND	ND	ND	0.005-0.1	See notes
Semivolatile Organics (mg/l)	625	ND	ND	ND	ND	0.010-0.050	See notes
TPH - Gasoline (mg/l)	8015 (modified)	ND	ND	ND	ND	0.05	Not listed
TPH - Diesel (mg/l)	8015 (modified)	ND	ND	ND	ND	0.2	Not listed

Notes: Original laboratory data supplied by AEL, Appendix E
 *US EPA, "Quality Criteria for Water," 1986
 ND = Not Detected at or above indicated detection limits
 N/A = Not Applicable.

Limit of Detection (LOD) for some EPA 624 and 625 constituents equal or exceed the following State MCLs.

Benzene	0.001 mg/l (MCL) / 0.005 mg/l (LOD EPA 624)
Carbon Tetrachloride	0.0005 mg/l (MCL) / 0.0005 mg/l (LOD EPA 624)
1,2 Dichloroethane	0.0005 mg/l (MCL) / 0.005 mg/l (LOD EPA 624)
1,1,2,2 Tetrachloroethane	0.001 mg/l (MCL) / 0.005 mg/l (LOD EPA 624)
Vinyl Chloride	0.0005 mg/l (MCL) / 0.010 mg/l (LOD EPA 624)

TABLE 8
ISLAIS CREEK PUMP STATION
GROUND WATER ANALYTICAL RESULTS FOR
FOR TITLE 26 METALS EPA METHOD 6010

	B3 (mg/l)	MW1 (mg/l)	MW1A (MW1 Duplicate) (mg/l)	MW1B (Field Blank) (mg/l)	Laboratory Detection Limit (mg/l)	State MCLs (mg/l)
Antimony	ND	ND	ND	ND	0.50	-
Arsenic	0.009	0.025	0.012	ND	0.005	0.050
Barium	0.51	0.48	0.80	ND	0.05	1.000
Beryllium	ND	ND	ND	ND	0.01	-
Cadmium	ND	ND	ND	ND	0.01	0.010
Chromium (Total)	0.29	0.09	0.42	ND	0.05	0.050
Cobalt	0.06	ND	0.10	ND	0.05	-
Copper	1.9	ND	0.09	ND	0.05	1.000/3.000* (Secondary MCL)
Lead	3.3	0.05	0.09	ND	0.05	0.050/0.005*
Mercury	0.0024	0.0015	ND	ND	0.0005	0.002
Molybdenum	ND	ND	ND	ND	0.05	-
Nickel	0.32	0.06	0.36	ND	0.05	-
Selenium	ND	ND	ND	ND	0.005	0.010
Silver	ND	ND	ND	ND	0.05	0.050
Thallium	ND	ND	ND	ND	1.00	-
Vanadium	0.18	0.07	0.31	ND	0.05	-
Zinc	3.2	0.09	0.35	ND	0.05	5.000 (Secondary MCL)

Notes: *Proposed, see RWQCB, June and November 1989

(-) = Dash indicates not existing

ND = Indicates Not Detected at or above indicated detection limits

Bolded values equal or exceed MCLs

Original laboratory data supplied by AEL, Appendix F

TABLE 9
ISLAIS CREEK PUMP STATION
WATER QUALITY OBJECTIVES FOR TOXIC POLLUTANTS
FOR SURFACE WATER DOWNSTREAM OF CARQUINEZ STRAIT *
(all values in ug/l)

	4-DAY avg	1-HR avg	24-HR avg	INST. max
Arsenic	36	69	-	-
Cadmium	9.3	43	-	-
Chromium (VI)	50	1100	-	-
Cyanide	-	-	-	-
Copper	-	5	-	-
Lead	5.6	140	-	-
Mercury	0.025	2.1	-	-
Nickel	-	-	7.1	140
Selenium	-	-	-	-
Silver	-	-	-	23
Tributyltin	-	-	-	-
Zinc	-	-	58	170
PAHs	-	-	15	-

Note: * Taken from "Water Quality Control Plan - San Francisco Bay Region",
Regional Water Quality Control Board, December, 1986

***ATTACHMENT 4
EXCERPT OF "PHASE II,
FINAL SOIL/GROUNDWATER
INVESTIGATION REPORT,
ISLAIS CREEK PUMP STATION
PROJECT," GEO/RESOURCE,
DECEMBER 1990***

Report

1514-00-03

**Phase II
Final Soil/Groundwater Investigation Report
Islais Creek Pump Station
San Francisco, California**

December 1990

 **DEC 10 1990**

Prepared for :
**City and County of San Francisco
San Francisco Clean Water Program**



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December 7, 1990
1514-00-03

Mr. Steven Medbery
SAN FRANCISCO DEPARTMENT OF PUBLIC WORKS
Industrial Waste Division
750 Phelps Street
San Francisco, California 94124

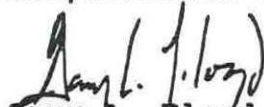
**RE: FINAL PHASE II - SOIL/GROUNDWATER INVESTIGATION REPORT
ISLAIS CREEK PUMP STATION PROJECT
SAN FRANCISCO, CALIFORNIA**


Dear Mr. Medbery:


Geo/Resource Consultants, Inc. (GRC) is pleased to submit the attached final Phase II - Soil/Groundwater Investigation Report for the aforementioned project. We refer you to the contents of the Report for details.

If you have any questions regarding the Report or any aspect of the project, please feel free to give us a call. Thank you for your continued support.

Sincerely,
GEO/RESOURCE CONSULTANTS, INC.


Gary A. Floyd, R.E.A.
Senior Environmental Scientist


Gregory T. Carbullido, R.E.A.
Principal, Environmental Programs Division


Alvin K. Joe, Jr. C.E.G. #1066
President and C.E.O.

Enclosure: Five (5) bound copies, one (1) unbound copy, Draft report with DPW written comments.

cc: GRC Project File 1514-00-03
GRC Chron

GAF/GTC/ADT:cdg

EPD5: 1514-L

PHASE II - SOIL/GROUNDWATER INVESTIGATION REPORT
ISLAIS CREEK PUMP STATION PROJECT
SAN FRANCISCO, CALIFORNIA

PREPARED FOR:
CITY AND COUNTY OF SAN FRANCISCO
SAN FRANCISCO CLEAN WATER PROGRAM

PREPARED BY:
GEO/RESOURCE CONSULTANTS, INC.
851 HARRISON STREET
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DECEMBER, 1990

JOB NUMBER: 1514-00-03

• Geo/Resource Consultants, Inc.

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1.0 INTRODUCTION

The San Francisco Clean Water Program (SFCWP) is currently evaluating the potential for installing a new Islais Creek Pump Station, and auxiliary pipelines, in connection with the existing Southeast Water Pollution Control Plant (SEWPCP) at 750 Phelps Avenue, San Francisco, California (See Figure 1). The project will require subsurface excavation, thus, the SFCWP must comply with Part II, Chapter 10, Article 20 of the San Francisco Municipal Code (Maher Ordinance). The Maher Ordinance states that a "site history for the property be prepared" and that soil sampling and analyses be conducted for "a construction project that involves the disturbance of at least 50 cubic yards of soil and; the parcel of land...is located bayward of the high-tide line as indicated on the Historic San Francisco Maps..." (Article 20, Sections 1001 and 1002).

Section 1002 of the Maher Ordinance provides a list of analyses or analytical parameters that should be conducted on soil samples collected from proposed zones of excavation. Section 1008(e) of the Maher Ordinance states that additional analyses, outside of those parameters indicated in Section 1002, should be conducted to address potential soil contamination resulting from historical and current site usage. In addition to the Maher requirements described for soil, the potential for groundwater contamination was also addressed by collecting and analyzing groundwater samples.

The purpose of this report is to provide findings and interpretations of the Phase II investigation, as well as summarizing findings and interpretations of the Phase I report (GRC, August 1990). A comparison of environmental conditions at the AC Auto Wreckers property and M&M Auto Wreckers (M&M) is also presented.

1.1 PROJECT BACKGROUND

The SFCWP, under the auspices of the San Francisco Department of Public Works, Industrial Waste Division (SFDPW), retained Geo/Resource Consultants, Inc. (GRC) to conduct a "Site History Review" (December 18, 1989). The Site History Review delineated potential contaminant sources in the vicinity of the proposed Islais Creek Pump Station facilities (referred to herein as the Islais Creek Pump Station site).

Based on findings presented in the Site History Review and requirements of the Maher Ordinance, GRC submitted a Sampling and Testing Plan to the SFDPW in January of 1990. The Sampling and Testing Plan presented recommendations and proposed methodologies for implementing a drilling and laboratory investigative program for the Islais Creek Pump Station site. The SFDPW provided GRC with comments on the Plan and a revised Sampling and Testing Plan was implemented in March, 1990 (Phase I: Soil/Groundwater Investigation, August, 1990).

Results from the Phase I investigation prompted the SFDPW to request GRC to further investigate the subsurface soil within the proposed pipeline excavation zone northwest and southeast of boring B10 (See Figures 1 and 2). Coupled with the additional investigation in the vicinity of boring B10, the SFDPW also requested that GRC investigate the M&M property located on Rankin Street near Evans Avenue (See Figure 2). The M&M property was selected as a potential alternative location to the AC Auto Wreckers property investigated in March, 1990.

The field methodology described in the Sampling and Testing Plan of January, 1990, was used for the field portion of the Phase II, Soil/Groundwater Investigation, which took place in September, 1990. In addition, information supplied in a site inspection conducted by Crosby & Overton, Inc. Environmental Management (C&O) for the M&M property was considered for this project (See Appendix A).

1.2 SCOPE OF WORK

The Scope of Work for both the Phase I and Phase II investigations were intended to comply with the requirements of the Maher Ordinance for boreholes within the Bay high-tide line.

The Scope of Work for the Phase I investigation was conducted under the direct supervision of a California Registered Geologist, and consisted of utility clearance; drilling and sampling of fourteen (14) soil borings; installation and sampling of one (1) groundwater monitoring well and sampling of one (1) existing groundwater monitoring well; testing of soil and groundwater samples using United States Environmental Protection Agency (EPA) analytical methods; and preparation of a Report that describes project methodologies, findings and interpretations for the purpose of characterizing chemical contaminants in the subsurface (GRC, August 1990).

The Phase II investigation was also conducted under the direct supervision of a California Registered Geologist. The Phase II investigation Scope of Work is as follows:

- 1) Utility Clearance
- 2) Drilling and sampling of seven (7) soil borings: two (2) in the vicinity of existing boring B-10, and five (5) on the M&M property.
- 3) Collecting three (3) HydroPunch groundwater samples on the M&M property.
- 4) Testing of soil and groundwater samples using the following analytical methods:

Title 26 Metals	(EPA Method 6010)
Lead (TTLC)	(EPA Method 7420)
Lead (STLC)	(EPA Method 7420, WET)
Copper (TTLC)	(EPA Method 7210)
Copper (STLC)	(EPA Method 7210, WET)
PCBs	(EPA Method 8080/608)

pH	(EPA Method 9040)
Flammability	(EPA Method 1010)
Cyanides	(EPA Method 9010)
Sulfides	(EPA Method 9030)
Halogenated Volatile Organics	(EPA Method 8010)
Aromatic Volatile Organics	(EPA Method 8020)
Purgeable Halocarbons	(EPA Method 601)
Purgeable Aromatics	(EPA Method 602)
TPH - Diesel	(EPA Method 8015, modified)
TPH - Gasoline	(EPA Method 8015, modified)
Oil and Grease	(EPA Method 9071)
Asbestos (PLM)	(EPA Method 600/M4-82-020)
Conductivity	(EPA Method 9050)
Chlorides	(EPA Method 9252)
Salinity	(EPA Method 2520)

- 5) Preparation of a Phase II: Report which describes the project methodologies, findings and interpretations for the purpose of characterizing chemical contaminants in the subsurface for both the Phase I and Phase II investigations.

2.0 INVESTIGATIVE METHODOLOGY

The field methodology described in the Sampling and Testing Plan of January, 1990, such as drilling and sampling methodology and decontamination procedures, was also implemented for the Phase II investigation. The activities conducted during the Phase II investigation include drilling and sampling seven (7) soil borings and collection of three (3) HydroPunch groundwater samples and associated laboratory analyses. Phase I and Phase II investigations are summarized below:

2.1 SOIL BORING AND SAMPLING

Phase I Investigation

A total of fourteen, 8-inch-diameter soil borings were drilled at the Islais Creek Pump Station site using a hollow-stem, continuous flight auger drill rig in March, 1990 (See Figure 2).

- o Borings B1 and B3 were drilled outside of AC Auto Wreckers property to investigate suspected solvents, fuels and metals contamination.
- o Borings B2, B4, and B5 were drilled on the AC Auto Wreckers property to investigate suspected solvents, fuels and metals contamination and a groundwater monitoring well was installed in B3.
- o Borings B6, B7, B8, B9 (A and B), B10, B11, B12 and B14 were drilled on Rankin Street, Custer Avenue, Davidson Avenue and Phelps Avenue to investigate suspected solvents, fuels and metals contamination.
- o Boring B13 was drilled on the Southeast Water Pollution Control Plant (SEWPCP) property to determine the potential for soil contamination in the immediate area.

The borings were located within proposed zones of excavation (See Figure 2), as required by the Maher Ordinance, and/or in the proximity of known or suspected contaminant sources identified in the Site History Review (GRC, December 1989).

The borings were drilled to total depths ranging from 13 to 18.5 feet below ground surface. These depths were selected to obtain samples of both fill and native materials. Borings were terminated in Bay Mud, near the top of the saturated zone to reduce the potential for groundwater contamination by overlying contaminated soil.

GRC collected two discrete soil samples from each of the 14 borings drilled during the Phase I Investigation. The soil samples were composited by American Environmental Laboratory (AEL) of Sacramento, California, prior to laboratory analyses. The composite samples were then analyzed in accordance with EPA Methods listed in Table 1.

All of the borings were continuously lithologically logged, according to the Unified Soil Classification System, by a qualified hydrogeologist. Logging was based on soil cuttings retrieved from the auger blades and from drive samples. All of the borings, with the exception of B3 (developed into a monitoring well), were backfilled with cement grout upon completion of sampling. Laboratory data are addressed in Section 4.0.

Phase II - Vicinity of Previously Drilled Boring B10

Two 8-inch-diameter soil borings (P-1 and P-2) were drilled using a hollow stem, continuous flight auger drill rig in the area of B10 (drilled during Phase I) on Davidson Avenue, within the proposed excavation, to depths of approximately 12 feet below ground surface (See Figure 2). The borings were located such that potential soil contamination to the northwest and southeast of the area of B10 could be laterally delineated as described below:

- o Boring P-1 was drilled approximately 75 feet northwest of B10, within the zone of proposed excavation. The previously drilled boring, B9, served as a control point further to the northwest;
- o Boring P-2 was drilled approximately 65 feet southeast of B10 within the zone of proposed excavation.

Three discrete samples from each boring were collected from approximately 5, 8.5 and 12 feet below ground surface. A total of six soil samples, three from each boring, were submitted to AEL for chemical analyses.

Phase II - M&M Auto Wreckers Property

Five soil borings (P-3 through P-7) were drilled and sampled and three HydroPunch groundwater samples were collected at P-3, P-5 and P-7 at the M&M property (See Figure 2). The 8-inch-diameter soil borings, and subsequent HydroPunch sample locations were placed such that potential soil and groundwater contamination associated with the M&M property may be identified. The boring and HydroPunch locations for the M&M property are described below and shown in Figure 2:

- o Boring P-3 was drilled approximately 50 feet southeast of Rankin Street and approximately 80 feet to the northeast of Evans Avenue on the M&M property. A HydroPunch groundwater sample was also collected at P-3;
- o Boring P-4 was drilled approximately 200 feet southeast of Rankin Street and approximately 40 feet to the northeast of Evans Avenue on the M&M property;
- o Boring P-5 was drilled approximately 250 feet southeast of Rankin Street and approximately 160 feet to the northeast of Evans Avenue on the M&M property. A HydroPunch groundwater sample was also collected at P-5;

- o Boring P-6 was drilled approximately 100 feet southeast of Rankin Street and approximately 195 feet northeast of Evans Street on the M&M property;
- o Boring P-7 was drilled approximately 150 feet southeast of Rankin Street and approximately 120 feet northeast of Evans Street on the M&M property. A HydroPunch groundwater sample was also collected at P-7.

GRC collected two to four soil samples from each of the five M&M property borings from approximately 1 foot to 12 feet below ground surface. A total of 10 soil samples (including three composite and seven discrete samples) were submitted to AEL for chemical analyses. Two discrete samples were submitted to ASBESTECH in Carmichael, California for asbestos analysis.

All Phase II soil borings were continuously lithologically logged, according to the Unified Soil Classification System, by a qualified hydrogeologist. The borings were backfilled with cement grout upon completion of sampling.

2.2 PHASE II - HYDROPUNCH INVESTIGATIONS

During Phase II, a total of three HydroPunch groundwater samples were collected at the M&M property. The rationale for selecting the HydroPunch methodology was to determine the characteristics, for disposal purposes, of ground water that may be encountered during excavation, and to minimize the number of wells that may be ultimately required for groundwater monitoring purposes. The HydroPunch samples were collected at soil borings P-3, P-5 and P-7 by hydraulically pushing a stainless steel sampler into the formation. Technical specifications for the HydroPunch are included in Appendix B. Decontamination procedures are described in Appendix C.

Bay Mud, was encountered at approximately 11 feet below ground surface which retarded groundwater flow into the HydroPunch, and precluded the collection of an adequate groundwater sample using specified HydroPunch methodology. At P-5, GRC collected ground water by lowering a Teflon bailer directly through the auger flights. This sampling methodology resulted in a highly turbid sample. In order to collect the remaining two samples, ground water was sampled within the more permeable soil layer above the Bay Mud. Due to slow groundwater recharge, GRC was unable to collect sufficient sample to submit a "blind" duplicate.

2.3 LABORATORY ANALYSES

Historical site usage information presented in the 1989 Site History Review, the findings of the Phase I investigation, and a 1990 site inspection (Crosby & Overton) provided the basis for selecting the appropriate EPA Methods for samples collected from various locations. The soil and groundwater samples, from both the Phase I and Phase II investigations, were submitted to AEL for compositing and analyses. The following suites of analyses were agreed upon by GRC and SFDPW for the Phase II investigation:

Vicinity of Previously Drilled Boring B10

Lead (TTLC)	EPA Method 7420
Copper (TTLC)	EPA Method 7210
Lead (STLC)	EPA Method 7420, WET
Copper (STLC)	EPA Method 7210, WET
TPH as Diesel (8.5' and 12', P-2 only)	EPA Method 8015 (modified)

M&M Auto Wreckers Property (Soil)

Title 26 Metals (TTLC)	EPA Method 6010
Lead (STLC)	EPA Method 7420, WET
Copper (STLC)	EPA Method 7210, WET
PCBs(only)	EPA Method 8080
pH	EPA Method 9040
Flammability	EPA Method 1010
Cyanides	EPA Method 9010
Sulfides	EPA Method 9030
Halogenated Volatile Organics	EPA Method 8010
Aromatic Volatile Organics	EPA Method 8020
TPH as Diesel	EPA Method 8015 (modified)
TPH as Gasoline	EPA Method 8015 (modified)
Asbestos (Polarized Light Microscopy)	EPA Method 600/M4-82-020

M&M Auto Wreckers Property (Ground Water)

Title 26 Metals (TTLC)	EPA Method 6010
Conductivity	EPA Method 9050
pH	EPA Method 9040
Salinity	EPA Method 2520
Chlorides	EPA Method 9252
Purgeable Halocarbons	EPA Method 601
Purgeable Aromatics	EPA Method 602
TPH as Diesel	EPA Method 8015 (modified)
TPH as Gasoline	EPA Method 8015 (modified)

3.0 REGULATORY FRAMEWORK

This section presents the environmental regulations which will be referenced for the purposes of data interpretation. The following are brief descriptions of the Maher Ordinance, Total Petroleum Hydrocarbon guidelines, Polynuclear Aromatic Hydrocarbons, San Francisco Bureau of Water Pollution Control Discharge Limits, the California Code of Regulations Title 26 and the Code of Federal Regulations.

3.1 MAHER ORDINANCE

As described in Section 1.0 of this report, the San Francisco Public Works Code, Article 20 (Maher Ordinance) states that a "site history for the property be prepared" and that soil sampling and analyses be conducted for "a construction project that involves the disturbance of at least 50 cubic yards of soil; and the parcel of land...is located bayward of the high-tide line as indicated on the Historic San Francisco Maps..." (Article 20, Sections 1001 and 1002).

Section 1002 of the Maher Ordinance also provides a list of analyses which should be conducted on soil samples collected from proposed zones of excavation within a project site. Section 1008(e) of the Maher Ordinance states that additional analyses should be conducted to address potential contamination from historical and current site usage. The Maher Ordinance states that if the level of any hazardous waste exceeds quantitative federal or state minimum standards, a Site Mitigation Plan must be prepared and implemented before the Director of Public Works may approve the building permit application. (Article 20, Section 1004).

3.2 CALIFORNIA DEPARTMENT OF HEALTH SERVICES

3.2.1 Total Petroleum Hydrocarbons

No regulatory threshold limit currently exists for total petroleum hydrocarbons (TPH) or total recoverable petroleum hydrocarbons in soil. A limit of 1,000 milligram/kilogram (mg/kg) TPH recommended by the DHS refers to TPH as gasoline. This value was based on ignitability characteristics of gasoline in sandy soil, and should not be applied to other petroleum hydrocarbons such as kerosene, diesel, Stoddard solvent or other fuel oils (See Appendix D).

In accordance with the California Department of Health Services (DHS) memorandum dated July 2, 1990, the 1,000 mg/kg limit is inappropriate to use as a sole criterion when designating a hazardous waste (See Appendix D). Additional toxicity tests, site-specific studies and agency interpretations may be required to provide definitive waste classification.

3.3 SAN FRANCISCO BUREAU OF WATER POLLUTION CONTROL DISCHARGE LIMITS

According to the San Francisco Bureau of Water Pollution Control/Industrial Waste Discharge, local sewer discharge limits, or pretreatment standards, have been developed by the RWQCB, for the City and County of San Francisco's industrial waste discharge (BWPC/IWD; 1990). Groundwater extracted from the Phase I and/or II sites during future construction dewatering will be discharged to the local sewer, if the local discharge limits are met.

3.4 CALIFORNIA CODE OF REGULATIONS - TITLE 26

3.4.1 Total and Soluble Threshold Limit Concentrations (Metals, Polychlorinated Biphenyls, and Asbestos)

Standards pertaining to chemical concentrations in soil (specifically at landfills) are described in Title 26 CCR Section 22-66699. These standards cite Total Threshold Limit concentration (TTL) values that should not be exceeded in a solid (i.e. absorbed in soil) and the Soluble Threshold Limit Concentration (STLC) that should not be exceeded in an aqueous solution (i.e. leached from soil). Metal concentrations in leachable form may be determined by conducting a Waste Extraction Test (WET). The WET, rather than the Toxic Characteristic Leaching Procedure (TCLP), was used for the Islais Creek Pump Station project due to its more aggressive leachate extraction procedures (EPA 1986b; Title 26 CCR 66700).

Wastes that exceed either the TTL or STLC values are considered hazardous wastes as per Title 26. TTL and STLC values are available for metals, pesticides, asbestos, polychlorinated biphenyls (PCBs) and several volatile and semi-volatile organics.

3.5 CODE OF FEDERAL REGULATIONS

Title 40 Code of Federal Regulations Part 261, Subpart C (Title 40 CFR), states that a solid waste is classified as a hazardous waste if it exhibits characteristics described in Sections 261.21, 261.22, 261.23 and 261.24 (See Title 40 CFR, Section 261.20). For purposes of evaluating Islais Creek soil and groundwater chemical data, the following definitions are presented:

Ignitability: Section 261.21 defines ignitability as "... (having a flash point less than 60 degrees Centigrade (140 degrees Fahrenheit)...)".

Corrosivity: Section 261.22 defines corrosivity as "...aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5...".

Reactivity: Section 261.23 defines reactivity as "...a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment...".

Although 40 CFR does not provide cyanide and sulfide limits specifically, a document published by the U.S. EPA Office of Solid Waste and Emergency Response provides cyanide and sulfide interim thresholds for toxic gas generation in solid waste as 250 mg/kg and 500 mg/kg, respectively (EPA, 1985).

EP Toxicity: As of September 28, 1990, Toxic Characteristic Leaching Potential (TCLP) has replaced EP Toxicity Procedure (Federal Register, March 29, 1990). EP toxicity limits are equivalent to TTLC and STLC limits set forth in Title 26. The difference between Title 26 (WET) and EP toxicity is the extraction method. The WET extraction method is generally considered to be more aggressive, resulting in conservative chemical results. The main difference between the EP and the TCLP is that the TCLP has a mechanism for determining volatile components which the EP does not. Additionally, 25 organic compounds have been added to the 14 currently regulated compounds (NUS Analytical Control, 1990).

4.0 INVESTIGATIVE FINDINGS AND INTERPRETATIONS

This section presents the investigative findings and provides interpretations of the analytical data for both soil and groundwater samples collected during the Phase I and Phase II investigations.

4.1 SOIL SAMPLING RESULTS

Phase I Investigation

Two soil samples, collected from two discrete sampling depths at each of the fourteen borings, were composited by AEL prior to laboratory analyses. The composite samples were then analyzed in accordance with EPA Methods listed in Tables 1 through 5.

Phase II Investigation

Three discrete soil samples were collected from each of borings P-1 and P-2, in the vicinity of B-10, from approximately 5, 8.5 and 12 feet below ground surface.

GRC collected two to four soil samples from each of the five borings drilled at the M&M property (P-3 through P-7) from approximately 1 foot to 12 feet below ground surface. Discrete soil samples collected from approximately 1-foot depth in all borings, and 8.5 feet in P-3 and P-7, were submitted for analytical analyses. Soil samples collected from approximately 8.5 and 12 feet in borings P-4 and P-5 were composited by AEL prior to laboratory analyses. Soil samples collected from 10.5 and 13.0 feet in P-6 were composited by AEL prior to laboratory analyses. The discrete and composite samples were then analyzed in accordance with EPA Methods listed in Table 8. A soil sample

collected at 11.5 feet in boring P-4 was archived at AEL in the event that additional testing may be requested. The soil data for Phase II are presented in Tables 8 through 12, Appendix E.

4.1.1 Metals

In the event that STLC analysis was not conducted for a given constituent, the TTLC data will be compared to the respective STLC values. If the TTLC value of a constituent in a solid waste is equal to, or greater than, 10 times the STLC for the constituent, the constituent will be identified as potentially hazardous. This application is appropriate because if the total amount of the constituent were soluble, its concentration would be diluted by ten-fold in performing the STLC analysis (WET), and the resulting extractable concentration in milligrams per liter would be one-tenth (1/10) of the total concentration in milligrams per kilogram prior to extraction.

Phase I Investigation

Interpretation of Phase I data below integrates findings presented in the Phase I report with STLC data obtained for discrete samples submitted during the Phase I investigation, but not included in the Phase I report. Appendix F contains the STLC reports which were interpreted here but not included in the Phase I report. Metal concentrations were compared with TTLC and STLC values as described in Title 26. With the exception of lead in several samples, none of the metals detected equaled or exceeded TTLC concentrations (Tables 3A and 3B). Lead exceeded the TTLC concentration of 1,000 mg/kg in composited samples collected at B3 (5,400 mg/kg), B4 (2,500 mg/kg), B5 (2,100 mg/kg) and B10 (2,800 mg/kg). Lead also exceeded the TTLC concentration in discrete samples B1 at 8.0 feet (1,100 mg/kg), B3 at 7.5 feet (3,400 mg/kg), B4 at 3.5 feet (1,500 mg/kg), B4 at 8.5 feet (2,500 mg/kg), B5 at 8.5 feet (3,700 mg/kg) and B10 at 8.5 feet (3,300 mg/kg) (See Table 4). The TTLC value for zinc (5,000 mg/kg) is exceeded in discrete sample B5 at 8.5 feet (6,400 mg/kg).

Lead concentrations also exceeded the STLC concentration of 5 milligrams/liter (mg/l) in most of the samples submitted for analysis (See Tables 3A, 3B and 4). Soluble lead concentrations ranged from 3.8 mg/l in the composite sample collected from B6 to 160 mg/l in the composite sample collected from B3 and was reported at 230 mg/l in discrete sample B3 at 7.5 feet. Additionally, the STLC limit for copper (25 mg/l) is exceeded in samples B3 at 7.5 feet (60 mg/l), B4 at 8.5 feet (310 mg/l), B5 at 8.5 feet (41 mg/l) and B10 AT 8.5 feet (37 mg/l). The STLC value for copper is also exceeded in the sample collected from the B10 composite sample at 27 mg/l. The STLC value for zinc (250 mg/l) is exceeded in discrete sample B5 at 8.5 feet (260 mg/l).

Data indicate that soil in the area of B1, B3, B4, B5, and B10 may be considered hazardous based on the TTLC values for metals. Data indicate that soil in the area of B1, B2, B3, B4, B5, B8, B10 and B13 may be considered hazardous based on STLC values for metals.

Phase II - Vicinity of Boring B10

The six discrete soil samples collected from P-1 and P-2, near the vicinity of B-10, were submitted for TTLC and STLC lead and copper analyses in accordance with Title 26. These analyses are referred to as CAM Metals analyses by AEL, however, for purposes of reporting the Phase II results, metal analyses will be referred to as Title 26 Metals (See Table 11A and 11B, Appendix D).

In borings P-1 and P-2, concentrations of copper did not equal or exceed STLC and/or TTLC values, whereas concentrations of lead exceeded the TTLC value in boring P-1 at 9 feet at 3,000 mg/kg, and exceeded the STLC value in borings P-1 (5.5 and 9.0 feet at 8.0 and 97 mg/l, respectively) and P-2 (11.5 feet at 49 mg/l, respectively).

Data indicate that soil in the area of P-1 may be considered hazardous based on TTLC values for metals, and soil in the area of P-1 and P-2 may be considered hazardous based on the STLC values.

Phase II - M&M Auto Wreckers Property

Ten soil samples (including composites) collected from the M&M property were submitted for lead (STLC), copper (STLC) and Title 26 metals analyses in accordance with Title 26 (See Tables 10 and 11A and 11B, Appendix D). Concentrations of lead exceeded the TTLC value in boring P-6 (composite from 10.5 and 13 feet at 3,500 mg/kg), while STLC values were exceeded for lead in boring P-3 (1.5 and 8.5 feet at 51 mg/l and 43 mg/l, respectively).

Samples that were not submitted for STLC but were found to contain TTLC concentrations equal to, or 10 times greater than the respective STLC values include:

Cadmium: in borings P-3 (8.5 feet at 11 mg/kg) and P-4 (composite from 8.5 and 13 at 21 mg/kg);

Nickel: in borings P-3 (1.5 feet at 200 mg/kg and 8.5 feet at 320 mg/kg), P-4 (1.5 feet at 450 mg/kg and composite from 8.5 and 13 feet at 560 mg/kg), P-5 (composite from 8.5 and 12 feet at 480 mg/kg), P-6 (composite from 10.5 and 13 feet at 530 mg/kg) and P-7 (8.5 feet at 1,300 mg/kg).

Data indicate that soil in the area of P-6 may be considered hazardous based on the TTLC value for lead and soil in the area of P-3 may be considered hazardous based on the STLC value for lead.

4.1.2 Total Petroleum Hydrocarbons - Gasoline and Diesel,
Total Oil and Grease

Phase I Investigation

Total petroleum hydrocarbons (TPH) as gasoline were not found to be present in any of the soil samples submitted for chemical analyses (See Tables 2A and 2B). TPH as diesel was detected at 10 mg/kg to 230 mg/kg in nine of the soil samples submitted for analyses (B1, B2, B5, B6, B8, B9B, B11, B13 and B14). Total oil and grease analysis was not performed on any of the samples collected during the Phase I investigation.

Phase II - Vicinity of Boring B10

The samples collected during the Phase II investigation in the vicinity of boring B10 were not submitted for TPH as gasoline due to the absence of either gasoline or diesel in the samples collected from B10 during Phase I. However, two samples were submitted for TPH as diesel from boring P-2, located in proximity to the Unocal gasoline station. The samples collected at P-2 at 8.5 and 11.5 feet were found to contain 680 and 200 mg/kg TPH as diesel, respectively.

Phase II - M&M Auto Wreckers Property

Total petroleum hydrocarbons (TPH) as gasoline was not detected in any of the soil samples submitted for analysis with the exception of 21 mg/kg and 4.5 mg/kg at 1.5 feet and in the 10.5 and 13.0-foot composite in P-6, respectively (See Tables 9A and 9B). These concentrations are well below the DHS recommended level of 1,000 mg/kg for gasoline.

TPH as diesel was detected in boring P-3 (8,500 and 15,000 mg/kg at 1.5 and 8.5 feet, respectively). Diesel was found to range from non-detected (ND) to 140 mg/kg in samples collected from borings P-4 through P-7. The soil samples collected nearest to the surface (approximately 1.5 feet in depth) from the M&M property revealed concentrations of oil and grease (total) ranging from 70 mg/kg in boring P-7 at 3.5 feet to 29,000 mg/kg in boring P-3 at 1.5 feet.

4.1.3 Volatile Organics and Semi-Volatile Organics

Phase I Investigation

No, or relatively minor, levels of volatile organics (EPA Method 8240), aromatic volatile organics (EPA Method 8020), halogenated volatile organics (EPA Method 8010) and/or semi-volatile organics (EPA Method 8270) were detected in various composite soil samples collected during the Phase I investigation (See Tables 2A, 2B and 5). None of the volatile organics detected are classified as hazardous under Title 26. Toluene may be a constituent of either gasoline, diesel or solvents. Acetone and methylene chloride may be constituents of degreasing compounds that may have been used at various locations across the site. The origin of chloroform in the sample collected from B5 is not known, but such contamination can occur during laboratory analysis; therefore, the detected concentration is likely to be a result of post sampling activities, and probably do not represent constituents of subsurface materials at the sample location.

Data indicate that the soil samples collected during the Phase I investigation do not appear to be hazardous based on volatile, aromatic volatile, purgeable halogenated and/or semi-volatile organics concentrations.

Phase II Investigation

Aromatic volatile organics and halogenated volatile organics were analyzed in accordance with EPA Methods 8020 and 8010, respectively. EPA Methods 8010 and 8020 were selected for samples collected from soil borings drilled on the M&M property where previous fuel and/or solvent-related activities were suspected (See Tables 9A and 9B). Based on results of the Phase I investigation, aromatic volatile organic and halogenated volatile organic constituents were not of concern in the vicinity of boring B10 (See Table 2B) and therefore, were not tested for during Phase II.

No halogenated volatile organics were detected in soil above the laboratory detection limits. Aromatic volatile organics analysis revealed that soil samples collected from boring P-3 (1.5 and 8.5 feet) were found to contain toluene at 0.008 mg/kg and 0.011 mg/kg, respectively. The soil samples collected from borings P-3 (1.5 and 8.5 feet) and P-6 (1.5 and composite from 10.5 and 13 feet) were found to contain xylenes at concentrations of 0.0021 mg/kg and 0.028 mg/kg, and 0.120 mg/kg and 0.027 mg/kg, respectively (See Table 12). Toluene and xylene may be constituents of either gasoline, diesel or solvents. None of the volatile organics detected are classified as hazardous under Title 26.

4.1.4 PCBs, Cyanides, Sulfides

Phase I Investigation

PCBs, cyanides or sulfides were not detected above laboratory detection limits in soil and thus, do not exceed limits set forth by EPA (Office of Solid Waste and Emergency Response; See Tables 2A and 2B).

Phase II Investigation

Cyanides were not detected in soil at either of the B10 area or at the M&M property, and thus, do not exceed limits set forth by EPA (Office of Solid Waste and Emergency Response; See Tables 9A and 9B). PCBs and sulfides were detected at concentrations which do not exceed limits set forth by EPA (Office of Solid Waste and Emergency Response).

4.1.5 Acidity and Flammability

Phase I Investigation

All of the fourteen soil samples submitted to AEL were analyzed for acidity (pH), and 9 of the 14 soil samples were analyzed for flammability. Soil pH ranged from 7.9 in B2 to 9.6 in B7, suggesting relatively alkaline conditions (See Tables 2A and 2B). Flammability was determined to be greater than 140 degrees Fahrenheit in all of the samples analyzed, and therefore did not meet the 40 CFR flammability criteria (See Tables 2A and 2B).

Phase II Investigation

Ten of the eighteen soil samples submitted to AEL were analyzed for pH and flammability. Soil pH ranged from 6.9 in P-6 to 9.6 in P-7, suggesting relatively alkaline conditions (See Tables 2A and 2B). Flammability was determined to be greater than 140 degrees Fahrenheit in all of the samples analyzed, and therefore did not meet the 40 CFR flammability criteria (See Tables 2A and 2B).